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ABSTRACT

This document is a report of the proceedings of a symposium on university distance education and innovations in telecommunications designed to provide a forum for the exchange of ideas among administrators, educators, and researchers representing various organizations and nations. It is noted that, in Asia and the Pacific region in particular, many countries are making extraordinary efforts to inaugurate new open universities utilizing, to a greater or lesser degree, telecommunication technologies. The following are included in the proceedings: (1) opening remarks by Kan-ichi Miyaji; (2) the keynote speech, "Life Long Learning and Technological Innovation," by T. R. Morrison; (3) "Broadcasting, Telecommunication and Social Development" (panel discussion chaired by Hidetoshi Kato); (4) "Application of New Media and Its Relationship to Guidance in Schooling" (panel discussion chaired by Takashi Sakamoto); and (5) "Technological Innovation and Life-Long Education--The Present and Future of Distance Education" (summarizing session of the entire symposium chaired by Moto-o Kaji). Participants in the symposium represented the University of Queensland (Australia); Athabasca University (Canada); the University of the Air, the National Institute of Multimedia Education, Tokyo Institute of Technology, the NEC Institute of Management, Ltd., Shinshu University (Japan); Sukhothai Thammathirat Open University (Thailand); the International Centre for Distance Learning (United Kingdom); and the National University Teleconference Network and California State University, Chico (United States). (DB)

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REPORT ON MULTIMEDIA EDUCATION

21E · JULY, 1990

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THE 2ND INTERNATIONAL SYMPOSIUM ON UNIVERSITY DISTANCE EDUCATION

"TECHNOLOGICAL INNOVATION AND LIFE-LONG EDUCATION"

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The Second International Symposium
on University Distance Education

Technological Innovation and Life-Long Education

Chiba, Japan

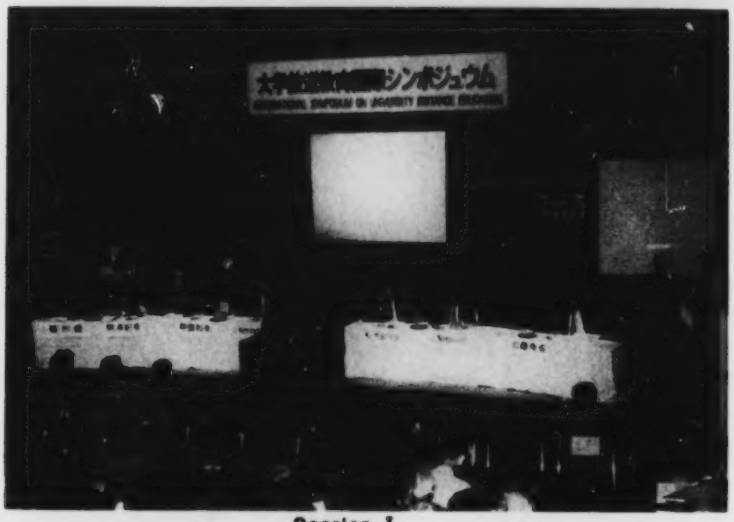
October 19-20, 1989

The University of the Air

National Institute of Multimedia Education

Opening Remarks by
Mr. Kan-ichi MIYAJI

Keynote Speech by Dr. T.R. MORRISON



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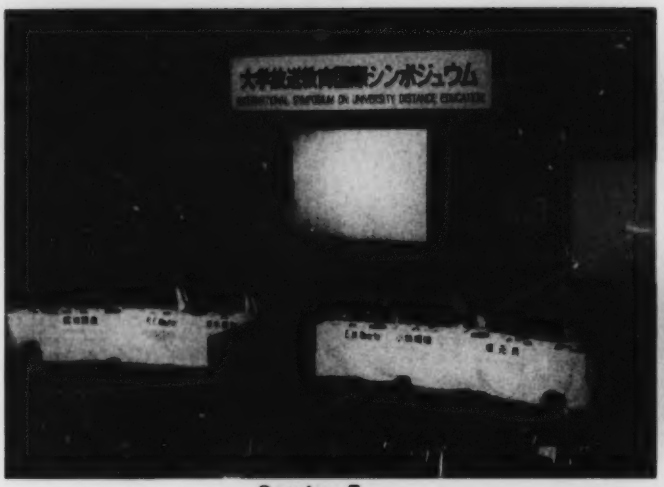
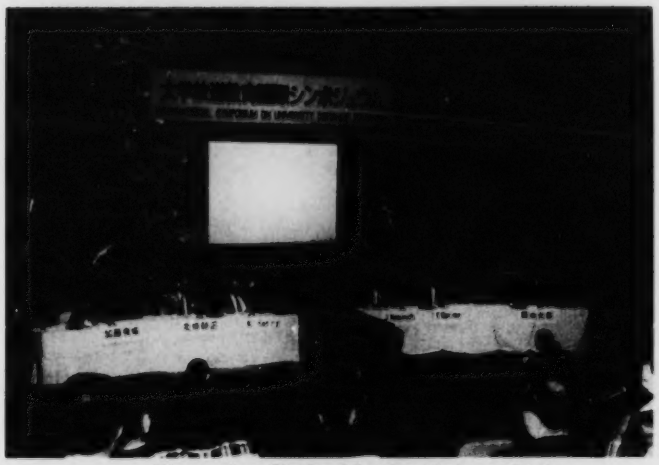
Question and Answer Period



Session I

Presentation by Dr. Yasutaka SHIMIZU

Audience



Discussion Chaired by Dr. Moto-o KAJI

PREFACE

The University of the Air and National Institute of Multimedia Education jointly sponsored the second international symposium on university distance education from October 19th through 20th, 1989, at the auditorium of the Institute. In view of the fact that university distance education has been making a great progress in past two decades, coupled with tremendous innovation in telecommunication, the exchange of ideas among administrators, educators, and researchers representing various organizations and nations was most appropriate and productive. In Asia and the Pacific region in particular, many countries are now making extraordinary efforts to inaugurate new open universities utilizing, more or less, telecommunication technologies. In order to make university instructions accessible to the masses of people, new educational policy with deliberate funding are necessary. But at the same time, inventiveness and enthusiasm of media practitioners and educators are essential. In this respect, this symposium reminded all the participants that international dialogue and cooperation were urgently needed. On behalf of host institution, we must send my deepest gratitude to all the participants who contributed such wonderful presentations and a series of discussions. We believe that this was another step forward to encourage university distance education throughout the world and to promote closer and better international network so that we can achieve promising future in this new venture.

Kazue Koda
President, University of the Air
Hidetoshi Kato
Director, National Institute of Multimedia Education

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John Henningham (Professor, University of Queensland, Australia)

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Jumpol Nimpanich (Dean of the School of Political Science, Sukhothai Thammathirat Open University, Thailand)
Hidetoshi Kato (Director, National Institute of Multimedia Education, Japan)

Opening Remarks

Kan-ichi Miyaji
Chairman, University of the Air Foundation, Japan

Moderator: Welcome to the Second International Symposium on University Distance Education jointly organized by the University of the Air and the National Institute of Multimedia Education. First of all, I would like to call upon the Chairman of the University of the Air Foundation, Mr. Miyaji, to deliver the opening remarks.

K. Miyaji: Good morning, ladies and gentlemen. It is my great pleasure to be able to say a few words of greetings to you at the opening of the Second International Symposium on University Distance Education jointly organized and hosted by the University of the Air and the National Institute of Multimedia Education.

The University of the Air is in charge of organizing this symposium, and I would like to briefly explain this university. The details are described in both Japanese and English in the brochures that have been distributed to you.

The university was established in 1983 as an institution of higher education using the new telecommunications system and also as a university best suited for life-long education. With the high hopes and expectations of the national public, the students started enrolling in 1985. There are several unique features of this university that distinguish it from other universities. One is that we have a television and radio broadcasting station that transmits lectures 18 hours a day, from 6:00 a.m. to 12:00 midnight. We also offer an open system where students willing to learn, can learn whoever they are, wherever they are, or whenever they want, a wide offering of higher education classes are thus available to people in the workplace and to housewives. At present, there are 26,000 students at the University of the Air. Their ages range from 18 to 90, and some married couples or three generations parents, children and grandchildren attend the school together. There are also some students of foreign nationality, and one percent of the student body are disabled a number ten times higher than a general university.

There are some students who already graduated from an other university or

graduate school but entered our university to learn, the fact that eighteen percent of our students have previously obtained college degrees is another unique feature of the University of the Air.

In March, 1989 we graduated our first class of 544 Students. Sixty percent of those students re-entered our university to continue their education. This clearly indicates the era of life-long education has arrived in Japan. We offer wide-ranging lectures covering the latest research and studies of as many as 300 subjects presented by the faculty of our university as well as faculty with other national, public and private universities in Japan. Starting this fiscal year we also initiated a Japanese language course for non-Japanese wishing to learn the Japanese language, the task of improving the modality and method of learning is on-going. We are now trying to expand the geographic area of our broadcast transmissions beyond the Kanto area so that in the future we can reach a wider portion of our country.

The other co-host, the National Institute of Multimedia Education, was established in 1978 as an institution for joint use by universities in Japan, we commemorated the tenth anniversary of NIME last year and, we have distributed to you the Institute's brochure which for your convenience is in, both English and Japanese.

The major task of this institute is to conduct research and development in the production of TV and radio programs for the university education system. A second task is to study distance education in various other countries of the world as well as to conduct research and development into the contents and method of education which uses multi-media in a comprehensive manner. NIME therefore contributes to the improvement and enhancement of higher education throughout Japan, of course including the University of the Air. Our institutions maintain a close, cooperative relationship with each other working in unison for the production of programs and research and development of various kinds. This hall we are meeting in belongs to the institute.

The first international symposium on distance education was held here at Makuhari in November 1986 on the theme of "The Outlook for the University Distance Education." The proceedings of those discussions were compiled are published.

This symposium aims at exploring the future image of education through distance education methods, with the participation of experts from many nations and through active discussions, we are certain to deepen our understanding of the effects of new media on learning. I do believe that the symposium will contribute much to the progress of our efforts in these areas, and we are fortunate to have the participation of experts who are highly knowledgeable and experienced professors.

From Canada we have Dr. Morrison from Athabasca University, a school which is

offering in Canada the first distance education using communications satellite.

From the Kingdom of Thailand we have Professor Jumpol Nimpanich of STOU which delivers a multi-media system for adult Life-long education.

From the United Kingdom we have Professor Keith Harry with the International Center for Distance Learning which provides various documents on distance education to institutions in many countries in the world.

From Australia's Queensland University we have Professor John Henningham who is also active as a journalist with the Australian Broadcast Association.

From the United States we have Professor Marie Oberle from the National University Teleconference Network which provides higher education through this unique system.

And also we have Professor Meuter from California State University at Chico which provides a Master of Science Course in computer science. We are very grateful to all your participants for coming here all the way from distant places.

And domestically from Japan, we have many experts, who will participate in the proceedings. We are also very grateful to all these participants.

Today and tomorrow, under the main theme of Technological Innovation and Life-Long Education, we shall be having two sessions. With your kind cooperation, I hope that this symposium will be most fruitful and that the outcome will contribute to the further development of distance education and higher education in general.

Before concluding, I would like to express our deepest appreciation for the kind support rendered to us in organizing this symposium by organizations such as Hoso Bunka Foundation, Broadcasting Cultural Foundation, as well as the International Communications Foundation and many others. On that note, I will conclude my remarks. Thank you.

Moderator: Now we would like to invite Dr. Morrison to give us the keynote lecture. Dr. Morrison majored in education and history at the University of British Columbia and taught at Manitoba University. He is the President of Athabasca University in Canada which is the major institution for distance education in Canada.

Keynote Speech

Life Long Learning and Technological Innovation

T.R. Morrison
President, Athabasca University, Canada

I have been asked to address the theme of life-long learning and technological innovation. This request, I must say, is quite daunting, since the development of life long learning patterns and the process and scale of technological innovation are two of the most dominant and enduring trends in the twentieth century. Moreover, these two processes are intimately related and, in the future, will become inextricably linked.

To some extent, life long learning is an imperative which flows from the very essence and scope of modern technological innovation. In this perspective, life long learning is a reaction to the scope of educational possibility which is inherent in technological innovation. At the same time, the varied processes and multiplicity of learning needs which flow from life long learning make on-going technological innovation an imperative.

Technological innovation and life long learning, therefore, exist in a symbiotic relationship, each impacting and being impacted by the other. Any effort to design systems of education and learning which encompass both technological innovation and life long learning must, of necessity, be based upon an awareness of this symbiosis. Beyond a recognition this symbiotic relationship, such a design for learning must also incorporate principles which are meta to life long learning and technological innovation. This superordinate frame of reference if necessary if learning systems are to be developed which are more than technology—dependent, on the one hand, or random excursions into the possible, on the other hand.

Thus,the purpose of this paper is to sketch the outlines of such a learning system; one which both accommodates and which builds upon the dual processes of life long learning and technological innovation, but is trapped, in its purpose, by neither.

These newly emerging educational modes, I call adaptive learning systems. Exemplars of these systems can be found in distance learning initiatives, in-house corporate training systems, computer conferencing networks, educational broadcasting services, global satellite networks, open universities, shared access data banks

and various adult learning projects. Moreover, adaptive learning systems are politically ubiquitous as exemplified in the fact that they can be found in the developed, newly developed and developing areas of the world.[1] They represent, therefore, a global development and, in this context, can be related, in significance, to the historic rise of basic schooling.

The Discontinuity of Life Long Learning

While learning has become a lifelong necessity, there remains a basic incongruence between that reality and the public and institutional policies within education. In today's world, the phrase "lifelong learning" is used as a rationale for changes which encompass a wide spectrum of reform proposals. The phrase is used with such off-handed ease, moreover, that it is my sense that we have lulled ourselves into believing that it is a living reality within our institutions. But is it?

The concept of lifelong learning was legitimated and injected into public consciousness through a 1972 UNESCO report entitled *Learning To Be*.[2] The very fact that such a report could be produced was revolutionary itself and provides a useful commentary on our times. Representatives from seven nations formed the commission: France, Chile, Syria, Peoples' Republic of the Congo, USSR, Iran, and the USA. If one reflects somewhat upon the political events which followed, this mix of nations is truly remarkable. Indeed, this report may have been the last major effort in which the two superpowers collaborated and agreed. It symbolized, if a modern term can be used, educational "glasnost."

In re-reading the report, it is evident that the commission had a very clear idea of what was meant by the concept of lifelong learning. This concept embodied six strategic principles:

(1) That dimensions of living experience must be restored to education by redistributing teaching in space and time.

(2) That education should be dispersed and acquired through a multiplicity of means—the important thing is not the path and individual has followed, but what he has learned or acquired.

(3) That the concept of a general education must be broadened so that it definitely includes general socio-economic, technical and practical knowledge.

(4) That educational action to prepare for work and active life should aim less at training people to practice a given trade or profession than at equipping them to adapt themselves to a variety of jobs, at developing their capacities continuously.

(5) That lifelong education, in the full sense of the term, means that business and industrial firms will have extensive educational functions.

(6) That access to different types of education and professional employment should depend only on each individual's knowledge, capacities and aptitudes and should not be a consequence of ranking or below experience gained during the practice of work.

If taken seriously, the concept of lifelong learning is a revolutionary idea, perhaps the only significant educational idea of this century. Those who advocate it are arguing in favour of the implementation, on a systems basis, of a number of subsidiary ideas: accessibility, institutional openness, needs-based learning, competency-based education, co-operative education, mastery learning, paid educational leave, and credit for prior learning.

To talk earnestly about developing educational institutions as centres for lifelong learning, then, is to urge change of a most fundamental order. Given the hypothesis, suggested by Clark, that the primary imperative of any institution is to control rather than liberate those within, it may be a false hope to assume that any institution *per se* can be founded upon lifelong learning principles.[3] But a learning system can, since it has a range and impact greater than the sum of its parts.

In this context, then, what we are experiencing today is a pressure against the internal and external boundaries of our formal learning system brought about, not by creative educational or policy thinking, but by the aspirations and actions of people themselves. If this pressure continues, as I believe it will, then one can argue that we shall witness either an accommodation within or a basic reconfiguration of our learning system. The shape, structure and degree of openness of our learning system not, as many argue, the financing of it, will be the policy issue of the future. This is so, since answering the former question inevitably begs an answer to the latter. To date, leaders in higher education have focussed upon the level of financing without realizing that this has energized an even more intriguing feedback loop: financing what?

The concept of lifelong learning, and the acceleration in the rhetoric in support of it, has affected both the expectations and behaviour of people. Increasingly, people expect that they will be learning throughout their lives. Indeed, for many, they expect that they will be "learning a living." In some societies, this expectation has been transformed into a sense of entitlement; that is, lifelong learning is seen, not only as preferable, but is also considered to be a right which should accompany national citizenship. Just as people receive salaries, they now want learning entitlements.

This shift from expectation to entitlement poses critical issues of financing, access and equity for Governments and employers. Moreover, the time gap in this shift from expectation to entitlement has narrowed rapidly. Co-terminous with what has been referred to as a rising revolution in expectations around the globe has been

an equally dramatic demand for learning entitlements. The right to learn now exists alongside the right to work and earn as goals of personal and national development.

Societies, particularly in the so-called developed world, are entering the age of the empowered learner. Unlike earlier eras in which dependency characterized the relationship of the learner to knowledge acquisition, the new learner has available real choices and options as to what he/she wants to learn, where, when and how. Even more important, the empowered learner is aware of his/her new found freedom. This growing availability of choice, and the awareness of such choice in learning, provides the fuel for a major dynamic which is pressing for the development of a much needed new design for education.

The Push of Change

While the emergence of the empowered learner is the axis around which a new design for education is and will be constructed, a collage of push and pull forces currently exist which reinforce this fundamental pressure for educational change. Not since the creation of public schools in the West, has society been faced with such a dramatic need or opportunity for educational change.

A number of factors today are pushing education and training systems toward change. Let us examine briefly some of the more salient of these, particularly as they impact upon lifelong learning.

Changed Learning Behaviour

The first factor, noted earlier, rests in the changing learning behaviour of people. Increasingly, people are learning in contexts outside of formal educational institutions. Concomitantly, their pattern of access to these formal institutions is becoming more recurrent, part-time, and problem-focussed.[4] This style of participation has forced many institutions to change their concepts of time, place, relevance and context for learning. Learners are pressing against the historic boundaries of education in such a way that the long-term relevance of our existing formal structures of education are open to question.

While attracting learners was once the paramount goal of educational institutions, accommodating and coping with their varying needs and learning styles is the dominant issue today.[5] As in the case of business, which has recently confronted a more sophisticated and demanding consumer, so too, education now faces the "informed learner." Given the dependency relationships which have traditionally underpinned most educational systems in the world, this is a development of historic and potentially revolutionary importance.

Institutional Gaps

The gap between the concept of lifelong learning, and its discontinuous expression in the institutional world of education, provides another push factor encouraging a new design for learning. This is not merely a reflection of a typical theory practise dichotomy, but is rooted in the fact that the concept of lifelong learning has moved from idea to ideology. As an ideology, espoused particularly among the adult education community, lifelong learning carries with it a growing body of adherents and exponents who press for change in accordance with these ideological principles.

The ideology of lifelong learning, moreover, has penetrated the thinking of people and groups outside of education in such a way that it also informs their calls for access, flexibility and change in education. In this context, the gap between the concept of lifelong learning and its revealed practise must be understood as a social and political issue in society, not merely a theory practise question. More and more lifelong learning, and its componential elements, is finding its way on the public policy agenda of nations. Once there, it serves as a benchmark against which educational systems are judged.

A New Economy

Most observers of the modern world consider that we are in the midst of a transformation in the basis of our economies.[6] While various terms are used, essentially there appears to be a consensus that knowledge and information, rather than natural resources, will form the bedrock of the new economy. This belief is reinforced by the growing capacity of computing and telecommunication technologies to generate, store, manipulate and transmit knowledge and data. When belief in change coincides with a capacity to change, the force of change increases exponentially.

If knowledge and information are central to the new economy, then providing timely, flexible and open access to knowledge becomes a critical issue. Here again one can witness a growing gap between established institutions of education and the learning imperatives of the new economy.

This gap is related to four factors:

(1) Information and knowledge are increasingly being generated in contexts other than higher educational systems.

(2) Information and knowledge are being transmitted and exchanged through vehicles beyond the control of formal educational institutions.

(3) Knowledge and information are being stored in a highly individualistic and decentralized manner.

(4) Knowledge and information are being accessed in flexible ways in which the typical concepts of time and place, within educational institutions, are of decreasing relevance.

The rise of the knowledge-based economy signals that the era of information scarcity is fast disappearing.[7] In this new economy, information is a sharable, miniaturizable, manipulable, transportable, and diffusive quantity. Unlike previous economies, the new imperative is to access rather than control information. Here again, conventional educational models, with their control and gate keeping posture toward knowledge and information, have an increasingly discontinuous relationship with the society in which they exist.

Value Added Opportunity

If the new economy is based upon knowledge and information, then simple principles of economics dictate that knowledge and information are value added sources of business opportunity. Education, in this regard, shifts from being seen primarily as a social good to becoming defined as a source of economic value. A rapidly growing number of companies and corporations recognize this shift in the social locus of education. In fact, education is emerging as one of the largest, relatively untapped business opportunities in the modern world. Private corporations, of all kinds, consequently, are entering the educational market in direct competition, not only with each other, but also with established educational institutions.

The entrance of the private sector into- the educational market, moreover, is not on the identical basis as educational institutions typically approach that same market.[8] Private corporations and firms are utilizing advanced tele-computing systems as a vehicle through which to offer their clients, educational and training programmes which are customized to their needs, results-driven in their design, flexible in their of delivery mode, accommodating of time and place variables and credentialized in outcome. From the customer's perspective, he/she knows, in advance, what he/she is paying for and the outcomes which accrue from success.

Ironically, the principles which guide the entrance of the private sector into the education market are those which are embedded within the concept of lifelong learning; although embellished with a profit motive. It is indeed interesting, moreover, that increasing numbers of people are willing to pay substantially higher fees for just such a learning experience. If these trends continue, then we are witnessing the early stages in the development of a private sector-based, parallel system of learning. Formal, public systems of education, as a result, will find themselves in a truly competitive environment in which the preferences of adult learners, in particular, will

determine market share and sustainability.

Demand-Saving Nexus

In most developed nations, educational expenditures absorb a large and rising share of overall governmental budgets. As many Governments attempt to balance their fiscal affairs, or at least restrain the growth of deficits, they must inevitably look to these educational expenditures as a potential source of saving. This focus on educational expenditure as a source of saving, however, usually runs head long into the rising demand for educational services among the populace; a demand ironically fuelled by the insistence, by most governments, that education is central to a vibrant society and healthy economy.

Faced with the twin pressures of fiscal saving and growing demand, Governments are eagerly examining ways to maximize their educational expenditures by increasing efficiency, productivity and effectiveness. In this situation, a replication and extension of existing modes of education, with their heavy infrastructure costs, is not seen as a viable alternative.

Governments are and increasingly will explore alternatives in education which promise increased efficiency, productivity and effectiveness. The possibilities inherent in the application of new information technologies to the development of new delivery systems for education are, consequently, quite appealing to policy makers. These systems, on the surface at least, appear to overcome many of the rigidities of conventional modes of education. While their initial infrastructure costs may be high, their long-term incremental costs are lower than conventional modes of educational delivery. Add to these factors, the "futurist glow" which such systems exude, and it is understandable why politicians are attracted to them. This demand-savings nexus is yet another push factor in educational change.

Networking

On a political map, the boundaries between countries are as clear as ever. Put on an economic map, a map showing the real flow of financial and industrial activity, however, those boundaries have largely disappeared. What has eaten them away is the persistent ever speedier flow of information—information that governments previously monopolized. In the past, as well, there were gross inefficiencies in the flow of information around the world. New technologies are also eliminating these inefficiencies.

Through this flow of information, we have become global citizens. As global citizens, we have emerging global needs which lead to global products.[9] As in the case of business, educators are coming to recognize that the universal flow of information

puts a premium on learning how to develop strategies and systems capable of meeting the learning requirements of a borderless world. The beginnings of a globalization of learning are before us, and from this, flows a new educational need—the need to interact on learning highways across borders.

Learning networks, rather than institutions, will provide the educational bridge to the future.[10] All nations, in future, will have to design their educational systems in such a way that they, not only have internal coherence, but also have an open architecture—that is they can network with other educational and learning systems.

In Europe the Delta Project of the EEC is precisely such a system, linking as it does national learning systems to a regional trans-European learning system.[11] In Asia similar developments are underway. And within the Commonwealth, there has emerged a new transnational learning network—the Commonwealth of Learning.

Inherent in the very process of globalization of economic activity, then, is a push factor for educational change. This becomes starkly clear when one realizes that to constitute education as primarily a function of the nation state is fundamentally different than to define it as part of pan—national learning networks.

It is impossible in the space available to explore fully all of the factors which are combining to push education toward change. One could, for example, examine work and the changing ways in which it is being undertaken and mediated by new technology. So too, one could examine alterations in the relationships between the sexes.

With this caveat in mind, a basic pattern of change is becoming clear: not only are learners becoming empowered, but, so too, the fluidity in the context of learning is reinforcing this empowerment in such a way that conventional approaches to education are increasingly lagging behind cultural, social and economic dynamics. It is at these points in time that revolutionary and quantum leaps are not only desirable, but possible. We are at such a time.

The Pull of Change

While the need for change in education has been recognized well before this era in history, it is only when that need is linked to the possibility of actual change that change occurs. Possibility requires a vision of how to achieve change and the provision of the means to achieve it. In this sense, possibility is a pull factor in change; it is both a guide to the future and a map to reach it.

Technological innovation is the pull factor which, heretofore, has been missing in efforts to realize the objectives and ideals of lifelong learning. It holds the potential of converting the desirable into the possible and achievable.

What is it about the new information technology, that holds such promise for lifelong learning? The new information technology essentially allows for the generation, storage, manipulation and transmission of large quantities of information at rapid speeds. In this regard, it is a simple concept, but one which deals with complexity. Parodoxically, in dealing with complexity, new information technology increases the complexity of that with which we can deal. It is "simply complex."

At least four features of the new IT reflect and reinforce the dynamics inherent in lifelong learning. First, IT reproduces and extends the capacity of the human mind and body. With IT, human beings can undertake tasks with a degree of precision and comprehensiveness not possible without it. Second, IT is whole medium: it simultaneously integrates text, voice and image in an interactive format. Third, IT expands he range of interactions potentially available to people. In this expansive interactional field, the person is not bound by place, time or the senses. Fourth, IT is potentially individualistic, fluid and decentralizing. It moves with the person, rather than forcing the person to move with it.

Lifelong learning means that people are empowered to learn what they want to, when they want to, where they want to, how they want to, and with whom. The new IT provides the means to allow this to occur. The expansive capacity of IT allows people to access what they want to learn, while the range of content available is a function of the power of IT not of the place of residence of status of the person.

IT is not bound by time—it is potentially available anytime. Through IT, a learner can access knowledge at any time. IT is not spatially bound. Increasingly it can be taken to the place where learning is to occur. The integration of voice, text and image available in IT allows for a range of learning styles, from print-based to highly tactile and visual modes, with or without the presence of other people. Lastly, IT allows for both individualized learning and larger more collaborative group based learning. Indeed, the range and complexity of group learning through IT is one of its major advantages.

One of the essential elements of lifelong learning is that it projects an image of a new society—a learning society in which the paramount skill is learning itself. Learning how to learn becomes a cardinal objective. The new IT's possess a hidden quality which, if properly utilized, can contribute greatly to this meta objective of life long learning.

As IT is used to reproduce, extend and improve upon the process of substituting machines for human agency, it simultaneously accomplishes something different. The devices that automate, by translating information into action, also register data about those automated activities. Thus, they generate, in the process, new streams of information. Scanner devices in supermarkets, for example, automate the checkout

process and simultaneously generate data that can be used for inventory control, warehousing and market analysis. CAL programmes, not only provide content and learning experiences, but also generate new data on the learners encounter with that content and those experiences.

Thus, IT is not mute. It not only imposes information via programmed instructions, but also produces information. It both accomplishes tasks and translates them into information. IT is reflexive: it reflects back on its activities and the system of activities to which it is related. It symbolically renders events, objects and processes visible, shareable and knowable in a new way. IT, to use Shoshana Zuboff's term, "informates" as well as "automates".[12]

The informating capacity of the new IT is of immense potential value in helping people to learn how to learn. The essential skill required in learning how to learn is the same quality contained in the new IT—reflexivity. To learn how to learn is to be able to step back and observe ones own learning processes as they unfold in different contexts. For this skill one needs information about that process, one's performance and style within it, and the way it links to other contexts. IT, while essentially a learner—centered technology, should also be seen as a teacher—guiding one in learning how to learn.

Adaptive Learning Systems

As the previous section hopefully illustrates, lifelong learning and technological innovation are indeed symbiotically linked. When one adds to this symbiosis an empowered learner, facing forces both pushing for educational change and pulling education in new directions of the possible, the need for a new design for education becomes pressing and real. And that is precisely what is occurring in the world.

During the past decade, various countries and regional associations, throughout the world, have faced a similar interlocking set of issues related to cost, scale, access, relevance, flexibility and quality in their educational and training systems. With increasing rapidity, particularly within the developing world, nations have opted for network as opposed to an institutional solutions to these vexing issues. In their approaches, and to varying degrees, information technology has been used to bind the parts of the learning network together. The common thrust in these developments has been to find ways to take education to people in their communities, rather than requiring them to access it at a common point and to do so in a way which fits learning around peoples' life and work patterns rather than the reverse. The cumulative impact of these new approaches to the provision of learning has led to a new concept of the design of learning itself; one which I call an adaptive

learning system. The innovation in these new adaptive learning systems centers not on the content transmitted, but in the processes used to transmit the content and the purposes to which the systems are directed.

And adaptive learning system is a learner—centered knowledge and information system designed to improve access to learning as a way of anticipating, responding to and creating change on an individual and societal level. Adaptive learning systems are designed to pursue their objectives, with increasing effectiveness, under both constant and changing conditions. Just as an adaptive learning system provides a context for individual learning and social adaptation, the system itself must be capable of learning and adapting. Adaptation involves the ability to respond to an internal or external change in such a way or to maintain or improve performance and effectiveness. Learning involves improving performance and effectiveness under unchanging conditions.

Adaptive learning systems are designed and managed in such a manner that learning and adaptation are purposeful activities. These systems, given their open and networked relationship to the environment, must build in mechanisms and processes which allow them to continuously learn how to learn and adapt. They are engaged, on an on-going basis, in what is referred to as double-loop learning.[13] Adaptive learning systems, thus, not only serve society and its learners, they *flow* with them.

Adaptive learning systems are characterized by the presence of four features. They are: learner-centered; open systems; change-focussed; and technologically-mediated. The uniqueness of adaptive learning systems does not rest in the presence of any single feature, since these single elements can be found in various educational institutions (eg. many early childhood programmes are learner-centered), but in the cumulative impact of the integration of these features in one system. The remainder of this paper examines adaptive learning systems in terms of their distinctive features, the application of new technologies within them, and the issues and potential which they pose for lifelong learning.

Learner-Centered

Not only are adaptive learning systems learner-centered, but they also reflect a newly emerging view of the learner. Indeed, the combination of learner-centeredness with a new view of learning gives these systems their truly unique character.

A number of recurring themes shape the new view of learning upon which adaptive learning systems are designed. These include:

(1) A concept of the active learner;

(2) The importance of meta-cognition;
(3) A learner-centered curriculum;
(4) The need for multiple representations of knowledge;
(5) The goal of mental self management.

The Active Learner

A growing body of research concludes that the dominant transmission view of knowledge, which so pervades conventional education, is fundamentally misguided. According to this transmission view, the major focus of educational activity is to provide well-structured presentations of material to be learned primarily through lecture, demonstration of recitation.

The concept of the active learner, on the other hand, understands learning to be *constructed* in terms of prior knowledge by an active learner functioning in a social context.[14] Knowledge, accordingly, is best acquired in functional contexts which exhibit similarities to future situations embodying knowledge transfer. Learners, it follows, need strategies to enable such knowledge transfer. The instructional result is the development, in learners, of a more flexible understanding which will better prepare them to meet the novel situations an uncertain world presents.

Since, in the new view of learning, knowledge is constructed by the individual, it follows that the learner is active. New knowledge, moreover, is acquired in relation to previous knowledge building upon intuitive, informal experiences. This "experiential knowledge", must be accounted for and built upon within education. It is one of the distinctive roles of an adaptive learning system to provide this bridge between experiential and formal learning.

The knowledge base acquired through adaptive learning systems, by the active learner is not inert, memorized for recall on tests, but alive, conditioned for application to appropriate contexts. This enlivened view of knowledge has led to a focus, in adaptive learning systems, upon such instructional strategies as "guided microworlds", experiential learning programmes and learning by doing. Through such methods, students acquire knowledge-in-use, experiencing and employing new ideas in situations which are similar to their desired contexts of transfer.

Meta Cognition

The new view of learning has also led to a reconceptualization of what it means to understand a topic. Understanding is seen as an active process guided by prior knowledge and expectations. Learners pursue understanding, through the application to experience and new knowledge, of frames or schemas which function as protypical problem solving and order-creating strategies.[15] These prototypical

schemas, when applied to more sophisticated levels of reasoning, form the basis of much current research into artificial intelligence and expert systems.[16] But they also exist within all so-called "novice learners". They key point is that it is a through these schemas, and the range available to learners, that understanding develops.

The new view of the learner, as a result, places great emphasis upon the use of meta cognition in learning.[17] This term encompasses both reflective cognition, one's awareness of particular characteristics of one's mental states or processes (eg. that list is too long for me to remember) and regulative cognition, ones rise of executive or monitoring strategies for guiding mental activities in problem-solving (eg. time allocation in studying).

Flowing out of these views of understanding, is a major pedagogical goal of adaptive learning systems: fostering autonomous learners through instruction in or experiences designed to develop learning to learn strategies.

Learner-Centered Curricula

For the past several decades, education has been content-centered. Recent learning research, however, poses a learner-centered view of curriculum based upon what has been termed a cognitive shift. While properly structured content is important to learning, that structure, should be informed by the knowledge states of the learner and built from that point. This view requires a shift, within curriculum development, from a focus on inert to applicable knowledge.

The learner-centered view of curricula has given rise, within adaptive learning systems, to the development and use of functional learning environments where basic skills are taught, not as ends in themselves, but as component tasks requisite to success in real activities. Real applications of knowledge to be acquired are at the core of instruction.

Learner-centered curricula also faces issues related to the individualization of learning. Research has shown substantial individual differences in experience with and the capacity to learn from different modalities, such as text, pictures, diagrams, graphs and equations.[18] In this context, there is emerging a distinction between text-based and graphically-based models of learning. This distinction has critical implications, within adaptive learning systems, for the design of visual learning environments.

Multiple Representations of Knowledge

Beyond the focus on individual differences, the new view of learning underpinning adaptive learning systems reflects the utility of multiple representations of knowledge for supporting learning, reasoning and problem-solving

activities.[19] Each representation system—natural language, symbolic equations, logical formalisms, pictures, functional diagrams, moving pictures etc., are seen as having strengths and weaknesses in what each provides as facilitation to problem-posing and problem-solving processes. There is, as a result, no single mode of representing knowledge which is applicable to all learners in all contexts. Hence, a goal of adaptive learning systems is to facilitate fluency in the various modes of representing knowledge.

Mental Self Management

The new view of the learner, underpinning adaptive learning systems, also gives rise to a new view of intelligence. In opposition to mind mapping, computational, faculty-centered, and cultural models of intelligence, adaptive learning systems reflect more the views of Robert Sternsberg who defines intelligence as a form of mental self-management[20]—the management of one's life in a constructive and purposeful way.

Mental self management, moreover, is congruent with the concept of the empowered learner in a life long learning context. It defines intelligence as the progressive development of the capacity to adapt to, select and shape environments. The ability to think and act in various contexts is, therefore, of paramount importance in developing one's mental self management capacity. Adaptive learning systems, since they can potentially take learning to a variety of contexts and involve various learners in those contexts, are ideally suited for the development of mental self management capacities.

Adaptive learning systems, unlike conventional approaches to education, rest on a view of learning which necessitates that the learner be taken seriously. In so doing, these systems face squarely challenges in design and implementation which go to the heart of issues related to how people come to know and understand. Given that many of these systems do not allow for regular corrections, through prolonged face to face encounter, these challenges and issues are inevitably debated publicly and self consciously.

Most adaptive learning systems are exposed systems, that is, they are open to public and peer evaluation; there is no classroom door to hide behind. For this reason, these systems have no choice in their willingness to articulate a vision of the learner and learning; nor to some extent of the society in which they exist. Their very existence will continue to provoke debate within education. Indeed, this is one of the latent functions of adaptive learning systems and should inform anyone's decision to become involved in their further development.

Open Systems

Adaptive learning systems, as the name implies, are systems of learning as opposed to institutions. As such, they demand a mode of thinking, a perspective on their role and function, which is quite distinct from that engendered in educational institutions.

In technical terms, a system, as argued by Rosensleuth & Wiener, is a set of two or more elements which satisfies the following three conditions:[21]

(1) the behaviour of each element has an effect on the behaviour of the whole
(2) The behaviour of the elements and their effects on the whole are interdependent
(3) however subgroups or elements are formed, each has an effect on the behaviour of the whole and none has an independent effect.

A system thus is a whole that cannot be divided into independent parts. The essential properties of a system, taken as a whole, derive from the interaction of its parts, not their actions taken separately. When a system is taken apart, it loses its essential properties. Because of this, a system is a whole which cannot be understood by analysis.

Synthesis, or putting things together, is the key to systems thinking; just as analysis or taking them apart was the key to machine-age thinking. Analysis focuses on structure; it reveals how things work. Synthesis focuses on function; it reveals why things operate as they do. Thus analysis yields knowledge; synthesis yields understanding. There are considerable differences between analytical and synthetic approaches to planning and management. One such difference is based upon the following systems principle: the performance of a system depends more on how its parts interact than on how they act independently of each other.

Adaptive learning systems, particularly when cast within the larger concept of open-learning systems, are ideally suited to planning and management within a systems perspective. These enterprises can be seen as parts of a larger learning system: the varied processes through which people acquire knowledge, values and skills on a formal, non-formal and informal basis. The meaning and function of adaptive learning systems, as a result, derives from the pattern and processes of the larger learning system and its interrelationship to it and its other parts. It follows that these systems are best construed, in the words of Arthur Koestler, as "a whole part of a whole".

Within such a systems perspective, a primary goal is to contribute to the larger learning system and to consciously build interrelationships and connections to it. The more interconnected adaptive learning systems are, the more effective they are. Their identity and legitimacy, within a systems perspective, derives not from isolation and uniqueness, but from relationship and a linkage to the community of learners. A clear

implication of this is the need to balance an analytical focus with its own nature and role—the part, if you like, with a broader focus on the learning system of which it is a part. This focus, rather than normative, in essence begins with it a simple descriptive question: What and how are people learning and what affects that process? An answer to this question should provide the appropriate context in which to locate an adaptive learning system and provide a sense of cultural meaning to the enterprise.

Adaptive learning systems must maintain fluid boundaries and be open to the society at large. Without such openess they, rather than being facilitative vehicles, can potentially emerge as yet another institutional barrier to learning. How can this be done? At this point, I would argue that it can be partly achieved through collaborative models of programme development and networking.

True collaboration in programme development goes beyond adversarial functions and moves towards real power-sharing with external groups and agencies. Moreover, it is premised upon the assumption, as argued by Botkin, that knowledge is socially constructed and, therefore, its transmission must be evolved in a social context. At Athabasca University, our recently developed special access project provides, in my view, an example of collaborative programme development, with all the give and take and mutual learning which that entails (Athabasca University Access Project 1986).

Networking means that an institution accepts the fact that, in certain cases, it is not the whole but a whole, part of a whole. The process expertise of distance-learning systems, for example, can provide a necessary and vital link in many areas where the components exist in isolation. This approach, in marketing terms, is called "nichemanship" and conforms to the ways in which, as described by Levitt, many people are finding solutions to personal, social and business problems.

Adaptive learning systems challenge substantially conventional approaches to the management of educational enterprises. They require what might be called an ecological perspective on management in which relational and functional dynamics are the most critical. Adaptive learning systems must be designed and managed in such a way that their parts fit each other so as to work together harmoniously, as well as efficiently and effectively. Such a view means that managers, within adaptive learning systems, must constantly guard against creeping myopia in their perspective. The early warning signal of the onset of this organizational disease is evident when one begins to believe in and act on the following principle:

> *If each part of an adaptive learning system, considered separately, is made to operate as efficiently as possible, the system as a whole will operate as effectively as possible.*

Change Focus

Adaptive learning systems are designed and funded, in most cases, as instruments of social change and development. They carry with them egalitarian and efficiency mandates to alter the existing pattern of access to learning and opportunity. Frequently, these mandates have a clear expectation that "results" will be achieved at "lower costs".

Unlike conventional models of education, adaptive learning systems function in an environment in which clear policy expectations exist and equally clear results are expected. Participatory, success and cost benchmarks inform the evaluation which they are subject to. This is both the bane and blessing of their existence.

This mandate for "affordable access" typically encompasses the following subsidiary participation goals:

- Increased Participation
- Broadened Base of Participation
- Targetted Participation
- Successful Participation

Increased Participation

Adaptive learning systems are perceived in many nations as a vehicle to increase the volume of participation in learning in society. This represents a quantitative objective which speaks to the absolute numbers of people who have access to or participate in learning. These systems have been remarkably successful in achieving such quantitative goals and have accomplished them using a variety of means. If quantity alone were the sole criterion of success, then adaptive learning systems have been resoundingly successful.

Broadened Participation

Broadened participation means opening up access opportunities for people who are geographically remote from centers of learning or culturally and economically distant from the mainstream of society and opportunity. Adaptive learning systems have been reasonably successful in overcoming spatial barriers to learning. This has been accomplished, particularly in recent years, through the utilization of regional centers and tele-computing technology.

The record of adaptive learning systems in broadening the social basis of participation is less stellar. By and large, the same groups who participate in formal schooling, participate in adaptive learning systems. Two factors help to explain this. First, to date, most adaptive learning systems assume the very skills which people, with

low participation rates, do not possess. Since most systems are print-based, for example, high literacy skills are usually required to learn. New CAL and other technologically mediated forms of learning, however, offer great promise in this domain.

Secondly, most research on adaptive learning systems, suggests that nonacademic factors play a significant role in determining participation. Attitudes towards one's competence, family circumstances, work styles, previous educational experiences, financial situation, time management skills, experiences of discrimination and prejudice—these, and a host of other non-academic factors, intrude between a person and his/her desire to access a learning opportunity, even when that opportunity is readily available.

In meeting the challenge of broadening the social basis of participation, then, adaptive learning systems must forge closer linkages with the social and economic context of current and prospective learners. Until recently, these systems have not formulated, in any conscious way, an image of human development unfolding within the context of the environment. This pattern exists, despite the fact that substantial cross-cultural research exists to document how socio-cultural environments shape human development. This research shows, among other things, that patterns of thought develop differently in different cultural contexts. The very role of cultural experience in shaping cognitive patterns, however, has been repeatedly confused with human capacity.

Michael Cole and his colleagues have recently proposed the concept of a situational code as a way of clarifying this confusion.[22] To Cole, cognitive processes and cognitive content, contrary to the view of most developmentalists, are intimately intertwined rather than discrete. Most measured differences between people, or the cultural groupings to which they belong, reside more in the situations to which particular cognitive processes reapplied than in the existence of a process in one cultural group and its absence in another. What is actually being measured in most adult and distance education research, then, is a situational code; a code that determines the cognitive process used in a given circumstance, making process, content, capacity and experience inseparable.

The concept of situational code poses several implications for adaptive learning systems, particularly in light of the future. *First* differences in the apparent capacities of individuals within the same culture may be, as the more recognized differences between people from different cultures, manifestations of different cultural codes. Most developmental assessments, then, are really, at root, *a priori* cultural evaluations which are then applied through a ranking process to individuals.

Secondly the concept of situational code suggests the need to uncover those

intellectual and other developmental capacities which are nested in various settings, and the degree of congruence between various people and these settings. Substantial research has recently unearthed in this regard, the situational codes of the school and charted the degree of congruence between these codes and "types" of student. A fruitful direction for research would be to examine the learning codes of the various non-formal settings in which adults participate, most importantly work and the family. Facilitating development for the diverse individuals who inhabit these settings may require a modification of settings as much as they do changing people.

Thirdly the concept of situational code and its relation to development makes the social structures in our society the basic problematic for education. In times of social stasis, an ideal type in any event, this problematic is less pressing. Today, however, various settings in our culture are being dramatically altered. New situational codes are being born out of the daily impact caused by such dynamic processes as technological change, new communication modes and demographic transiteris. In fact, one could argue that essentially new types of people are being created in these settings.

Lastly the concept of situational code presents us with the need seriously to question the tendency to stereotype people and their capacities by the behaviour they exhibit in particular situations. It requires, in particular, that we realize the tentative nature of our knowledge of any one person at any point in time or in any particular setting. A more holistic and inquisitive approach to the person is urgently demanded; one which is open to discovering new capacities, particularly those blinded to our consciousness by the settings in which we observe people.

If development is rooted in situations and their codes what, then, does this suggest for adaptive learning systems? Obviously educational institutions, and people within them, must be more outwardly sensitive to the emergent structures within which people, in any given culture, find themselves as they are growing and developing. This demands a degree of cultural sensitivity not often characteristic of formal educational institutions which, by and large, still define their own particular settings as master contexts for human development. The growing decentralization in the accessibility of the populace to knowledge and information, and the various settings within which this knowledge can be accessed, makes clear that the dominance of formal institutions in this area may be fast disappearing.

Rather than formal educational institutions teaching the current or next generation, they may have to learn from it. The schools and universities, as other educational institutions, have traditionally been storehouses of knowledge to be transmitted across the generations. In future, if these institutions are to retain their educative roles, they must become places to which people come to share the knowledge they have acquired in other settings. In this context, educational institutions become

less storehouses and transmitters and more synthesizers and interpreters of that which is known.

Adaptive learning systems, if they are to fulfill the role of cultural interpreter, will also of necessity, have to rethink many aspects of their current structure and process: the focus on knowledge transmission, age segregation, professional exclusion and isolation from the culture. More importantly, the staff within these systems must acquire and openess of mind toward the fundamental processes of societal learning with all its diversity and unpredictability.[23]

Successful Participation

Until recently, most adaptive learning systems have focussed their efforts on increasing access to learning. This focus is understandable, since the concept of access has been traditionally linked to the idea of equality of opportunity. Policy makers, for instance, have tended to believe that the goal of educational equity is attained when the conditions exist in which no person is denied access to higher education because of race, income, social status or place or residence.

This concentration on access has resulted in a front-end and input-focus in programme and systems design. Removing barriers to access, be they of time, space of life circumstance, for example, has been the abiding concern of distance education. Flexible registration procedures, the use of communications technologies, regional centres, tutorial support systems, and educational counselling services have all been used to remove access barriers and, judging by growing participation rates, they have achieved a good deal of success.

Equalizing access, however, does not necessarily equalize the chances of success for learners. The barriers which block a person's access are not those which prevent success following admission. Access barriers relate primarily to such factors as time, space, lifestyle, income and a person's perception of competence. Success barriers also relate to these factors but, as argued by Jencks and Astin, also encompass such variables as preferred learning style, cultural assumptions within curricula, the labelling process, and power relationships.[24] An adaptive learning system which is geared, not only to increasing access, but also to altering the social pattern of its outcomes, must confront squarely the barriers to success. Equality of opportunity, in other words, must be linked to equality of results. Most importantly, this linkage must be forged in ways which recognizes what Amy Guttman postulates as the twin principles underpinning a just approach to education: non-discrimination and non-repression.[25]

The idea of equality of results often brings forth counter-arguments regarding a presumed decline in equality or excellence. In other words, is it true that an outcomes

orientation, and the changes required to achieve it, leads inevitably to a decline in quality and, hence, works against the egalitarian ideal itself?

An outcomes orientation, contrary to the criticism it suffers, does not alter the substance of what is learned. Rather, it concentrates on the processes of learning—on how that substance is acquired. Much of the debate abut a presumed decline in quality, in the face of an equality of results scheme, wrongly assumes that quality is a function of how one learns as opposed to what is learned. If, for example, the learning time for *X* is elongated to accommodate a cultural difference, and if the student, as a result, learns *X*, then has there been a decline in quality or a rise in efficacy?

Moreover, a concept of quality in education, which is not tied to the developmental capacities of a person and to the socio-cultural context in which these are expressed, is ultimately a mask shielding the fact that bias is the operative principle. The function of such concepts of quality is not education—that is, the development of the talents of those who participate—but exclusion, selection and tracking.

Any real social impact of adaptive learning systems must occur at the level of outcomes.[26] It is at this level, that the potential redistributive function of education occurs. In order for adaptive learning systems to redistribute real opportunity in society they must increase both their efficiency in guaranteeing access and their efficacy in producing success. To accomplish these twin goals means that adaptive learning systems must undertake a thorough examination of their processes and models to determine whether or not they provide for maximum access to success. Such an examination, I would suggest, would be challenging, if not intimidating to most institutions. But if the rhetoric is to match reality, it needs to be done.

Given that problems of access and success are linked to social, cultural and economic factors, no adaptive learning system alone will be sufficient to broaden access or increase success. The difficulty embedded in this suggestion is that some educators have become so wedded to particular concepts of adaptive learning systems, and the belief system which it engenders, that they have become the "new traditionalists" in an innovative field. They resist thee idea that any given system alone may be inappropriate to the attainment of social goals. Instead, as other educators, they insist on forcing all needs and goals within an adaptive learning framework. The model, in other words, not only confuses, but dominates reality.

If they are to fulfill their wider mission, adaptive learning systems need to be recast conceptually and linked to the broader and more normative concept of an open-learning system. An open-learning system is characterized by five features:

- the absence of a discriminatory entrance requirement
- a results-driven concept of equality
- a success-based concept of programme and service design

- a multiple strategy and matching model approach to programme delivery
- a developmental concept of quality.

When assessed against these criteria, it is apparent that an adaptive learning system is not necessarily an open-learning system. This distinction, and the failure of many adaptive learning systems to assess its implications for change, explains why such systems have not achieved a broadening of the social base of access or significantly increased levels of success for diverse students. This is not to criticize the achievements of adaptive learning systems, but to suggest that, if their exponents intend to take broadened access and success seriously, then these systems must take the next step towards the development of open-learning systems.

Targeted Participation

By targeted participation is meant a focussed approach to increasing the participation of selected groups in learning, or achieving a broader range of participation in specific learning goals. Adaptive learning systems have been used, on a selected group basis, to increase the participation of women and minorities in learning. These programmes, when successful, have typically provided specialized recruitment, on-going counselling, modified curricula, front-end learning skills, and focussed financial supports. They tend, as well, to be more staff intensive and involve collaborative models of programme development. Even when successful, though, such programmes often face arguments concerning the differential treatment of specific groups in the context of an ideology of universal service.

Adaptive learning systems have also been used to involve various people in selected learning goals. Literacy and employee training provide two examples. Broadcast media have been quite successful in constructively attacking such problems as literacy. The individualistic native of this learning environment has been able to overcome somewhat the stigma of illiteracy and group evaluation.

An increasing number of companies are developing in-house adaptive learning systems to achieve their training goals. These systems are gaining in prominence, since they deal simultaneously with a number of issues in the corporate training environment:

(1) Timeliness—training provided when needed;
(2) Customization—training designed for the specific needs of a specific firm;
(3) Adaptability—training that can be modified as circumstances change;
(4) Cost—training which is taken to the learner in a cost-effective manner;
(5) Scale—training that can cope with large and dispersed numbers of people;
(6) Flexibility—training that allows for a variety of learning modes and styles.

Adaptive learning systems, whether functioning in a public, voluntary or private

sector context, reflect and induce change in societies in which they exist. Their change impact is at two levels. First, they provide a means to accommodate the processes of life long learning within existing learning systems. That is, they offer a flexible option parallel to conventional learning and one more attuned to an empowered learner. To date, this has been the predominant role of adaptive learning systems.

There is, however, a second, and more fundamental change impact of adaptive learning systems on the horizon. This impact involves not only first order change, that is change *within* the existing learning system, but also second order change, change *of* the learning system.[27] This potential for second order change flows in part, from the natural affinity of and increasing linkage of new information technologies to adaptive learning systems. It is to this possibility that we now turn.

Technological Mediation

It is difficult to imagine a discussion of education in the wanning decades of the twentieth century which does not stumble over, or face squarely, questions posed by the rapid development of new information technologies. Adaptive learning systems share, with these new technologies, a quest to find new ways to mediate the relationship between a person and experience. Of all areas of education, adaptive learning systems are most intimately intertwined with technological development and, for that reason, face issues which are at the forefront of these developments.

The new "Republic of Technology", as Daniel Boorstin the Librarian of Congress has named it, is a world of obsolescence.[28] It is not normal for a publisher of a book, as part of his/her sales pitch, to talk of the book's relationship to newer writing which will make it obsolete. The book stands alone, a symbol of tradition and perseverance. Newer technologies, particularly computers, however, are marketed on a relational basis. They exist at a point between the past and a changing future. They represent and embody change, not permanence, offering the consumer only a glimpse of the future.

The new obsolescence generated by technology is particularly problematic for adaptive learning systems, for these technologies are being used, not as additional stand alone devices, such as books, but as integral aspects of the delivery system itself. Decisions about the role and application of new technologies in adaptive learning systems are decisions about the enterprise itself. This produces an interesting double bind for these systems: not to use new technologies makes the adaptive learning systems obsolete; to use new technologies, however, ensures that the adaptive learning system is obsolete. How these systems cope with this iron law of obsolescence will affect profoundly the ways in which new technology is used.

The Republic of Technology is also a world of convergence wherein there is a

tendency for everything to become more like everything else. Each step in the development of modern technology tends to reduce the difference between older categories of experience. Consider, for example, the once basic distinction between transportation and communication: between moving the person and moving the message. While communication was once an inferior substitute for transportation (you had to read about it because you couldn't get there), it is now often the preferred alternative.

The T.V., by traditional categories, a mode of communication, brings together people who still remain in their living rooms. With the increasing congestion of city traffic, with what is now called "the" parking problem, and holding patterns in airports, our T.V. becomes a preferred way of "getting there". Now, when it comes to public events you are often more there when you are here than when you are there.

The new convergence wrought by modern technology applies as well to technology itself. While previously, in communications technologies, we witnessed the separate development of systems to carry voice, image and data messages, today there is a growing convergence in which voice, image and data are transmitted simultaneously and in a way in which there can be a high degree of interaction between the senders and receivers.

This development has also bred a new category of participant the intervener: a person who is neither a sender or intended receiver of the message, but who, by virtue of an ability to link with the network, can intervene and become a sender, receiver or observer. The use of computer conferencing in adaptive learning systems is a case in point. In many of these systems, overall enrollment is dramatically affected by just such interveners.

In adaptive learning systems today new information technologies are employed at three levels: as a tool in the learning process; as an aid to the learning process and as the medium of the learning process.[29]

IT as Tool

Using computers and other forms of IT as an object of the learning process represents their development as tools. Until recently, this was the dominant use of IT in education. In essence, this has involved the study of a computer, as an information processing machine and the training of people in how to use it.[30]

While initially an obsession with the variation in hardware, this approach has now shifted to the soft-side. Students are introduced to programming languages, operating systems and, increasingly, are taught the skills for the adaptation of these tools to their unique needs. The assumption in these efforts has been that, since computers were becoming universal, everyone should know about them and how to use them.

This logic led to substantial investments in such efforts. As computers become increasingly user-friendly, however, the need to learn how to use them will dissipate somewhat as the need to understand the internal workings of a telephone has in order to make a call. The only area of continuing need may be as in driver education, for safety and security reasons.

IT as Aid

Using IT as components of the learning process represent the use of technology as an aid. By and large, most development of IT in adaptive learning systems is at this level today.

IT as an aid to learning generally has been used on three levels:

(1) data and wordprocessing;[31]

(2) content modules;[32]

(3) intelligence extenders.

Data processing uses have been developed to allow students to manipulate information or process it during their learning.[31] Computer-assisted and telematic modules, within courses, have been developed as aids to learning and to build skills related to decision-making and analytical situations.[32]

More recent developments have involved the use of computers as intelligence extenders.[33] These "cognitive technologies", or "workbenches", make qualitatively easier the specific mental activities involved in complex tasks, such as collecting data, crafting ideas, writing, and designing and running experiments. What these applications have in common is to make more accessible, with less mental effort, the achievement of what are considered to be complex acts of mind. Unlike so called machines that think, these intelligence extenders enable students to better express and build upon their own creativity and intelligence.

IT as Medium

Using computers and integrated interactive systems as the actual ambient of learning represents their deployment as the medium of learning. Three levels of application can currently be seen in adaptive learning systems. The first, involves the translation of textual course material into a computer format with remedial and branching enhancements. This form of computer based learning offers individualized study, instant evaluative feedback, depth learning and remediation. The key is that these are provided in an integrated format, with access being tailored to a person's stage in learning.

A second level of application is in what is known as context based learning. Through the use of micro worlds, students are provided with dynamic computer

models of systems or parts of systems which can be studied without the support of an instructor.[34] Such modes of learning have been described as discovery worlds. Unlike earlier simulations, though, these discovery worlds allow students to change the properties of the system or to construct their own. This represents, through the use of IT, the concept of the active learner constructing knowledge.

Apart from micro worlds, most technologies in education are print based. The so-called text reading eye has been the primary sensory channel in the learning process. This has resulted in a radical impoverishment, given the senses available from which learning takes place in the world.

This state affairs will change in the near future. Dramatic developments in the consumer electronics, telecommunicating and electronic publishing industries are rapidly making available low cost, high quality and high volume editing and storage technologies for high speed access to high quality still and full motion imagery. These developments will make possible the development of dynamic, interactive, multimedia learning environments that can access vast archives of text, image and sound for educational purposes. Given these developments, and the need for multi-media literacy which flows from them, it is safe to say that out whole concept of what is possible in the range and mode of learning will have to be re-thought.

As the use of new technologies in adaptive learning systems move from tool, through aid to medium of learning, the tendencies of these technologies to structure experience for the learner emerges as an important question. All technologies, print included, do this. We know something about how print structures experience and the pros and cons of that. What we do not know enough of yet is how electronic communication systems and their supporting conceptual apparatus do this. We know one thing from the history of print: it can and has been used for control or empowerment. Given that technological development appears to create its own momentum, adaptive learning systems must inevitably debate, within that context, the organizing principle for its use: to control of empower people.

Until recently, the possibility of serving learners simultaneously, on both an individual and social basis, was a faint hope. The challenge, in this regard, has been to find a way of meeting the learning needs of people, both as individuals and parts of a larger whole.In other word,s, to serve them as individuals and members of various social groupings simultaneously. It is what Arthur Koestler has called the Janus principle: "treating people as whole parts of a whole."

Newer technologies, and most particularly their tendencies toward integration of voice, image, text and data, offer adaptive learning systems a unique enabling device. These newer technologies now deal with differentiated parts of the wholes they are part of. They are able to get specific about parts that earlier technologies had to leave

undifferentiated. In addition, they operate at such fast speeds that they can treat parts simultaneously. Speed and specificity are the hallmarks of these new technologies and they provide the foundation for the next stage in the development of adaptive learning: what can be called the "mass customizing of adaptive learning."

Consider, as an example, the potential of integrating speed, specificity, mass and customization, the current developments in teletraining. Building on base teleconferencing technology, tele-training systems now currently exist which enhance two-way audio with two-way video, two-way tele-writing, and individualized computer communication. Voice, image and data are combined in one interactive system.

This technology enables one to teach across a wide geographic area and to do so on a group and individual basis, or a combined group-individual format simultaneously. AT&T in the USA currently has 330 tele-training centers for in-house training of over 45,000 students per year. This training can be offered on a mass basis, an individualized or customized basis, or a mixture of both and on a need-to-know or fast track basis in terms of the time gap between indentified need and training response.

Tele-training and other such interactive, and convergent technologies, allow for the intervention, at various points in the learning cycle, through education linkages. Each person, theoretically, is at a different stage in the learning cycle and functioning as an individual or member of a larger group or both. This is the context which generates both the need and possibility for mass customizing in education. Add to this the variations in time (when to know) and learning need (need to know) demanded in a training context and mass customizing becomes even more important.

Given that new technologies enable the mass customization of education, all education programs, institutions and systems exist somewhere on the mass customized continuum. Moreover, various components of their system also exist on this continuum.

A mass customized approach to education, particularly within a distance education context, empowers people both as individuals and members of social and cultural groupings. It avoids the trap of confusing sameness with equality: a logical fault in the assumptions which underpin most educational efforts to reduce inequity. The mass dimension speaks to the non-discrimination principle, while the customized dimension allows one to address non-repression. The mass customization approach, finally, allows the design of programs which addresses the life context of the learner and to do so in a way which is sensitive to the differentiated experience of people in the learning cycle. And it is through the appropriate application of new, more integrated and interactive technologies, which enables this mass customization to be a reality in education.

A strategic device that can assist adaptive learning systems in a planned approach to life long learning is the mass-customization matrix. This matrix links the targeted learning context, either a mass or customized focus (with various points on the continuum possible) with the strategic focus of the organization, expressed in terms of products, services, markets or delivery systems. Products, services, markets and delivery systems, as the chart shows, can either be standardized or customized, with various combinations among them. Thus, as the chart displays, a standardized product can be developed with customized services and delivery systems and provided to segmented markets. This type of matrix analysis, similar in ways to portfolio planning techniques, provides a way for an organization to re-think its strategy within the context of mass-customization.

The Emerging Human Gap

At the outset of this paper, I noted that addressing the issue of the relationship between life long learning and technological innovation was a truly daunting task. Given the number of themes touched upon in this paper, I think the reader will concur with this assertion. The themes of life long learning and technological innovation are compelling, since they evoke images and visions of educational potential, and speak clearly to those learning needs which are so vital to social development and national economic health. It is understandable, in this context, why proponents of information technology and life long learning are so zealous in their advocacy and why as well those outside of education find these ideas and technologies so appealing. However, a cautionary note is warranted.

Unquestionably, new information technologies hold tremendous possibilities for the future development of adaptive learning systems. This potential is further enhanced because of the natural affinity of new information technologies to these systems and their barrier-removing goals. As these information technologies become more pervasive, in adaptive learning systems, the problem of human factors will increasingly confront these systems. By human factors is meant the gap between human and machine capabilities.[35] To avoid this gap growing wider, a major social innovation is needed; one which will effectively integrate information technology into the work place. Effective integration should not be confused with the diffusion of such technology in organizations. The latter refers to quantity, how much is used; the former to strategy, why it is used.

To date, vast sums of money have been spent on information technologies in adaptive learning systems without a clear understanding of how people can optimally integrate with these technologies. Information systems expert Paul Strassman notes,

for example, that over the last decade USA corporations have increased their data processing budgets an average of 12% per year. At the same time, productivity increases averaged only 2% per year. At Athabasca University our productivity increase over a three-year period has been 25%, but our budgetary expenditures on information technology has more than doubled. This gap is now more than a matter of intellectual curiosity.

Increasingly, managers and others are beginning to be disturbed by the discrepancy between gains in productivity and rates of fiscal outlay on information technology. Although we may not know how to definitively measure productivity in the service economy, the evidence is growing that whatever we are measuring is not necessarily appreciatively benefiting from the massive influx of information technology. The costs of dependency on new information technology, in other words, should not be confused with productivity improvements which flow as a result of its application.

Information technologies can now give us more information, more quickly than we can possibly absorb it. There is no possibility for most of us to access all the available information or of utilizing it effectively. Information technology, ironically, can also ruin our lives unless we think of new ways to get it under control. In the past, according to Daniel Dennett, people could lead lives of "unavoidable ignorance". We now have unlimited opportunities to know and this information obligates us to act.[36] At the same time, particularly in a management context, we draw on the available information, unable to make decisions. The end result is what Stan Lee calls Dunn's Conundrum: that is, "negative information": "information that reduces rather than increases one's knowledge".

Managers frequently complain, today, that information technology has not lived up to its potential. But this is not true. These technologies have lived up to their potential; indeed they regularly exceed expectations. The real problem is that human beings and forms of social organization have not caught up. At Athabasca University, we have developed a totally computerized and integrated student information system. Yet, this system hinges on the abilities of secretarial and clerk positions to enter and read data properly. One mistake in either function, not only neutralizes the technology, but creates massive systems and client service problems. So too, academic policy decisions in our university are made with no reference whatsoever to the information systems developments which are necessitated in their implementation. This parallel decision process, of course, leads to dramatic costs in labour and dollars. I am not arguing that academic policy should be dictated by technological systems, but a new relationship between each is required, if only on a cost basis.

It is necessary to reestablish, at this juncture in time, an age old principle: that in

organizations there is no substitute for human intelligence. It is also necessary to examine critically, what information technology can do to support that element, as well as how it might interfere. There is in fact, wisdom what is known as the "Law of the Hammer". This law states that when you give a child a hammer, everything becomes a nail. There are many functions, particularly those involved in analyzing and assimilating information, that do not necessarily benefit from new technology. The technology may provide an aesthetic adornment of the future, but it does not substantively alter or improve it. Indeed, new information technology can actually impair these functions or render them more complex than they are or need to be.

Unless we in education are to be ruled by technological innovation, being locked in forever in a reactive mode, then that process and its application to life long learning must be *managed.*

In attempting to manage technological innovation and its application to adaptive learning systems, one will soon find a paucity of successful models or approaches.[37] This is due primarily to the tendency, until recently, to regard new technological innovations with a sense of awe and corresponding feeling that they could only improve upon current practice. It is only now, after many organizations have rendered substantial investments of people, time and money in new technology, that there is a growing recognition that new technology, in an uncontrolled environment, can pose monumental problems for educational institutions.

Personal experience, to date, suggests four rules which every educator should employ in decisions about new technology. Call these Morrison's iron laws:

- Focus on Strategy
- Beware of Complexity
- Control the Underground
- Avoid Mysticism

Focus on Strategy

Most organizations, educational institutions included, are guided by a strategy, whether clearly espoused or embedded in its activities. This strategy is usually composed of two parts: a vision of the future and an understanding of the unique attributes which will get one there. New IT should only be introduced if it does one of two things: (1) Is sufficiently compelling to have you change your vision or (2) adds significantly to your unique attributes and will get you to your goal more quickly. If your organization exists in a competitive environment, then IT should be used to maximize your competitive advantage.[38] If it does not, IT should not be used. If you have no vision, and are unaware of your unique strategic attributes, and have no plan for maximizing your competitive advantage, then IT will merely add to your basic

confusion. Technological innovation, in other words, should be guided by organizational strategy. If you cannot answer the questions of why you want to use IT, you are better off not using it.

Beware of Complexity

Many organizations are beginning to see that IT, from a cost perspective, is like language: it has a surface and deep structure. The surface structure, what many managers see, are what are called hardware costs—the price of machinery. The deep structure, of IT, surprising to many managers, generates other costs related to licencing, maintenance and software. These deep structural costs, surprising as well to managers, often are significantly higher, overtime, than the surface costs. Once managers recognize the surface and deep structural costs of IT, they often feel more in control, even if shocked by the awareness itself. But this sense of control is an illusion, for there exists an even more fundamental driver of costs in IT, the core driver at both structural levels. This core is complexity. The more complex the IT system, the more costly it is and will become.[39] Highly integrated systems mean that a change in one part necessitates a change in one or all others and generates cost. Radical simplification should be every manager's fundamental rule in IT.

Control the Underground

All too frequently, IT systems are purchased, installed, initial systems developed and approved, and then forgotten about or left to "experts" to run. The assumption is that you know what you bought and paid for and the rest is implementation.

Nestled within implementation, however, is a cost driver of monumental significance. It is called on-going system development or better yet systems "enhancement". These enhancements are not only undertaken by computer services or MIS staff, but increasingly come as a result of what I call "random fiddling" by users, many of whom are at low levels in the organization. The occasional bit of fiddling is of no import. But the cumulative impact of fiddling and enhancements can be of such a scope- as to change the actual system purchased when compared to the system-in-use. These underground systems development (in the sense that they are rarely approved) can add substantial costs to IT systems and, overtime, make systems obsolete. Beware of this underground.

Avoid Mysticism

Computers are the icons of the modern age. They generate a form of worship and Messianic activity among believers that has not been seen since the Christian crusades. Discussions about hardware and software options often are permeated with a mystic

quality. Unless one is a firm believer, a dangerous state of mind in the computer world, the best posture for rational decision-making is a secular and atheistic one. Focus on function and benefit, rather than from and style. All things considered, it really is true: a box is a box.

The ultimate logic of lifelong learning is that it leads to a mass market of unique individuals. From an educational perspective, if one is serious about lifelong learning, this poses the challenge of finding ways to meet the tailored learning needs of individuals and doing so on a mass basis. New information technologies, if applied appropriately within adaptive learning systems and in a way which is congruent with the principles which underpin such systems, can allow us to do just that. Together, information technology and adaptive learning systems allow for a unique form of educational holography: a unity of person, process, content and context within a stream of change.

Conclusion

The concept of life long learning, at heart, speaks to questions of human potential and to the factors which impede or facilitate its expression. Seen in this light, life long learning is a deeply humanist philosophy of education. Life long learning challenges all of us to provide the conditions in which all human beings can pursue their learning destinies and, in that process, contribute to the betterment of the human community.

Life long learning is guided by three interrelated goals. The first is to remove those barriers which stand in the way of a person acquiring the capacities which allow for the expression of particular potentials. This is life long learning as the *enabling* of learning; that is, to allow it to it to occur in the first place. These are primarily access issues.

The second goal is to establish facilitative conditions under which learning skills can not only be acquired, but broadened, and applied. This is the *development* of learning. These are primarily *process* and *design* issues.

The third goal is to provide circumstances and contexts in which people are in a position to develop their potentials as they choose. This is life long learning as the *empowering* of learning. These are primarily issues of *value*, *power* and *control*.

Life long learning, then, is not merely focussed upon the present, but intimately concerned with the future, both of individuals and societies. Within the perspective of life long learning, the person is perceived not just as what he/she is, but as what he/she might become, under what conditions he/she is likely to become, and what, if he/she chooses, he/she will become.

If one wishes to assess the potential contribution of technological innovation to life

long learning, then, of necessity, a number of fundamental questions must be explored. Unless one is to assume that technological innovation is, by definition, a positive contributor to life long learning, then one must ask pointedly whether it contributes to the enabling, development and empowering of learning. To ask that any activity in society be able to address such challenging expectations may appear to some to be unfair. Not to ask that technological innovation address itself to these goals, however, is to forfeit a unique opportunity to develop human potential and contribute to the social betterment of humankind. For this reason alone, a commitment to life long learning is a very serious business indeed.

NOTES

(1) See G. Ram Reddy ed. *Open Universities: The Ivory Towers Thrown Open* (New Delhi, Sterling, 1989); Carnegie Commission on Higher Education, *The Corporate Classroom* (NY: Carnegie Foundation (1985) and M. Knowles, *Andragogy In Action* (San Francisco, Jassey Bass, 1988).

(2) E. Faure, *Learning To Be* (Geneva, UNESCO, 1972).

(3) B. Clark, *The Higher Education System* (Berkeley, University of California Press, 1983) pp. 107—110.

(4) P. Cross, *Adults As Learners* (San Francisco, Jossey Bass, 1983).

(5) See D. Bok, *Higher Learning* (Cambridge: Heavard University Press, 1987) pp. 114—158.

(6) See, for example, M. Dertuzzos, R. Thurow, R. Solow, *Made In America* (Cambridge, MIT Press, 1989), M. Poire and C. Sabel, *The Second Industrial Divide* (NY: Basic Books, 1984), and N. Hakino, *Decline and Prosperity: Corporate Innovation In Japan* (NY: Harper Row, 1987).

(7) See H. Cleveland, *The Knowledge Executive* (NY: Dutton, 1985).

(8) The Corporate Classroom, op. cit., pp. 1—20.

(9) See K. Ohmae, "Managing In A Borderless World", *Harvard Business Review.*

(10) See R. Wigard, "Integrated Services Digital Networks: Concepts, Policies and Emerging Issues" *Journal of Communication*, Winter, 1988, pp. 29—49.

(11) European Economic Community, *Delta Project* 1985.

(12) Shoshana Zuboff, *In The Age Of The Smart Machine* (NY: Basic Books, 1988) pp. 1—19.

(13) C. Argyris, *Reasoning Learning and Action*, (San Francisco, Jossey Bass, 1982).

(14) See R.S. Sternberg, *The Triarchic Mind*, (NY: Harper, 1988); "Cognitive Science and Education", *Cognitive Science*, June 1988, pp. 21—44.

(15) M. Gardner, *Frames of Mind*, (NY: Basic Books, 1987).

(16) J.R. Anderson, *Cognitive Psychology and its Implications*, (San Francisco: Freeman, 1985).

(17) J. Segal, S. Chipman and R. Glaser ed. *Thinking and Learning Skills: Relating Instruction "To Basic Research"* vol. 1. (NY: Hillsdale 1988).

(18) See R.E. Snow, "Individual Differences and The Design of Educational Programs",

American Psychologist, vol. 41, pp. 1029—1039.

(19) D.G. Bobraw, "Dimensions of Representation", in D. Bobrow and A. Callins ed. *Representation and Understanding Studies In Cognitive Science*, (NY: Academic Press, 1976), pp. 1—34.

(20) R. Sternberg, *The Triarchic Mind*, (NY: Harper, 1988).

(21) A. Rosensleuth and N. Wiener, *Philosophy of Science*, vol. 17, pp. 318—326.

(22) M. Cole, *Education In Cultural Perspective* (NY: Basic Books, 1983).

(23) See D. Michael, *On Learning To Plan: On Planning To Learn*, (San Francisco: Jossey Bass, 1979).

(24) A. Astin, *Achieving Educational Excellence*, (San Francisco: Jossey Bass, 1984) and C. Jencks, *Inequality*, (NY: Doubleday, 1975).

(25) A. Guttman, *Democratic Education*, (Princeton, Princeton University Press, 1987).

(26) G. Psascharopoulus and M. Woodhall, *Education For Development*, (NY: Oxford University Press, 1986).

(27) See P. Watzlawick, *Change*, (NY: Norton, 1981).

(28) D. Boorstin, *Hidden History* (NY: Oxford University Press, 1985), pp. 170—195.

(29) See Tony Adams, "Computers in Learning — A Coat of Many Colours", *Computers and Education*, vol. 12, No. 1, 1988. pp. 1—7.

(30) A. Luehmann, "Should The Computer Teach The Student of Vice Versa", R. Taylor ed. *The Computer In The School*, (NY, Teachers College Press, 1989).

(31) R. Degl'Imocenti and M. Ferrais, "Database as a Tool for Promoting Research Activities in the Classroom — An Example In Teaching Humanities", *Computers and Education*, vol 12. No. 1, 1988. pp. 157—163.

(32) M. Schwartz "Computer Software For Critical Thinking", *Computers and Education*, Vol 12. No. 1, 1988, pp. 163—168.

(33) S. Brand, *The Media Lab*, (NY: Harper, 1987).

(34) Allan Martin, "An Adaptable Micro World for the History Classroom", *Computers and Education*, Vol 12, No. 1, 1988, pp. 169—172.

(35) E. Weiner and A. Brown, "Human Factors: The Gap Between Humans and Machines", *The Futurist*, Vol XXIII, No. , June 1989, pp. 9—11.

(36) D. Dennett, *Mind Design* (NY: Plermin, 1985).

(37) See W. King, "How Effective Is Your Information Systems Planning?" *Long Range Planning*, Vol 21, No. 5, 1988, pp. 103—112, and W. Ramsley, "Towards a Framework for Analysis of Country Active In the Field of Information Technologies and Education", *Journal of Education Policy*, Vol 4, No. 2, 1989, pp. 135—148.

(38) M. Porter, *Competitive Advantage*, (NY: Free Press, 1987).

(39) See M.R. Smith, "Technologizing Office Work", *Society*, Vol. 26, No. 1, June 1989, pp. 65—72.

Moderator: Thank you very much, ladies and gentlemen. According to the information in front of you please take and enjoy your lunch.

Session I

Broadcasting, Telecommunication and Social Development

Chairman: Hidetoshi Kato
Director, National Institute of Multimedia Education, Japan

Chairman: Now, we would like to start the First Session this afternoon, entitled "Distance Education and Social Development through Broadcasting and Telecommunication". As situations differ from one country to an other, so also the situation of higher education differs. We have in this session four participants from Thailand, the United Kingdom, Australia and Japan:

First, Professor Jumpol Nimpanich from Thailand's S.T.O.U. Professor Nimpanich is the Dean of Political Science at S.T.O.U. Open University.

Professor Keith Harry from the United Kingdom is the Director of the International Centre for Distance Learning, United Kingdom, which is situated in London. Professor Harry is the Documentation Officer for ICDL.

Sitting next to Professor Harry is Professor John Henningham, the Professor of Communication Journalism Department at Australia's Queensbery University.

Professor Koda is the President of the University of the Air of Japan.

The time allotted for each presentation is 30 minutes. After the presentation by professor Koda, there will be a video presentation on the University of the Air which will enhance your understanding of the University.

I would like to add one or two comments here. First, the paper by Professor Nimpanich is not included into the booklet. It has been distributed to you separately. Secondly, the English version of Professor Koda's presentation, which was translated from the original Japanese text to English, entails a few mistakes which were made due to the time constraint placed on the translators. Consequently, Professor Koda will be making corrections to some of the errors in the English version.

In order to stay on time, I shall proceed right away. Since we are five minutes behind schedules, please keep your time strictly within thirty minutes. First, I would like to call upon Professor Nimpanich.

J. Nimpanich: Thank you, Mr. Chairman and all of the distinguished participants.

First of all, I want to say that STOU's President can't join you at this very important

conference because of his urgent business in Bangkok. However, he extends his,apology to all of you, and asked me to serve as STOU's representative at this symposium.

Secondly, in presenting this paper "Broadcasting, Telecommunicaton and Social Development", I do not speak as an expert on broadcasting and telecommunication, but as an academician who realizes and accepts that these technological innovations are very important to society both now and in the future.

Thirdly, before understanding to what extent broadcasting and telecommunication as communication and educational media function in the development of Thai society, what obstacles are to be faced and what must be done if social development in Thailand is to progress carefully, by using STOU as a case study on how broadcasting and telecommunication are utilized in Social Development, I would like to first clearly define the concepts of broadcasting, telecommunication and social development.

By "broadcasting" I mean "transmission of radio and television programmes," while by "telecommunication," I mean "communication at a distance or the transmission of information from one place or another through electromagnetic radiation". I will be discussing broadcasting and telecommunication in terms of communication and educational media, and how they function in the social development of Thailand. As a communication media, broadcasting and telecommunication should be directed at presenting information which helps create a persuasive atmosphere, effecting change in public attitudes, and imparting the necessary education so that the public is able to adapt to the changes being made in the development process. As an educational media, broadcasting and telecommunication should be directed towards the transmission and creation of instruction which promotes an understanding of the details of content, experiment etc.

In the case of "social development," if viewed at the macro-level, the term is equivalent to national development. However, I will consider social development at the micro-level, that is, human resource development both as an important force and recipient of the process of national development.

It is accepted that among experts in the area of communication, modern and complex communication technology has an enormous influence on the rise and smooth progress of social developments in developing countries. This includes both broadcasting and telecommunication. Thailand, in terms of nationwide, is no exception, well realizing the capabilities of communication in developing human resources. With the inequality and lack of opportunity in education, broadcasting has been widely employed.

Three types of educational broadcasting programmes are transmitted throughout the nation:

The first type is the programme for informal education. The second type is the

programme for formal education. And the third type is the programme for non-formal education.

In general, these programmes are produced by governmental agencies and institutions of higher education, including private agencies who rent air time on government broadcasting stations, these are usually entertainment or commercial related, programmes rather than general information or public service programmes. This situation has been raised during meetings of the National Public Relations Boards Division, but a clearcut solution hasn't yet be an identified.

However, the Government is endeavouring to increase the use of broadcasting nationwide as is seen in the emphasis placed on broadcasting in the Sixth National Economic and Social Development Plan. This may be a result of the fact that the number of households having radios and televisions have increased.

In 1979, about 6 million household had radio. By 1985, 8 million homes had a radio. In the case of television sets, 1 million households had a set in 1979, in 1985, that number had grown to 4 million. In addition research indicates that the public, especially in the rural areas, listen to radio and watch television more frequently.

Drawing on this new importance of radio and television, STOU was established as a distance education institution with the mission to create a distance teaching system that uses a mixed media packet comprised of textbooks, work books, cassette tapes, various reading materials, and especially educational radio and television programmes. Since broadcasting and telecommunication as communication and educational media, have an important role in the development of human resources. Let us examine now STOU broadcasting serves the STOU students. In the case of radio, STOU produces 15 to 17 radio programmes of 20 minutes length. In case of television, STOU produces 30 minute programmes. The total number of broadcasts, produced by STOU are 207 radio programmes per week or 10,764 per year are 52 television programmes per week, or 2,704 per year.

STOU has ten schools, from Liberal Arts to Communication Arts to Communication Arts and a total of 522,353 students. Most of whom are seeking bachelor degrees in addition, an average of 97% of the students of STOU are employed —mostly in government serviced.

The radio programmes are broadcast daily through the radio network of the Public Relations Department by USF system from the main transmitting station in Bangkok to 11 sub-stations, from Bangkok to Mae Hong Son. And in the case of television programmes, STOU sends tapes of the programmes to local stations all over the country for broadcasting these local stations such TV broadcasting station, Channel 11, PRD channel 4, 5, 6, 7, 8, 9 and 10.

To ascertain the use of and interest in the university, radio and television

educational programming, a study was conducted of one thousand and fifty students from sixty provinces in 1987 by the System Management and Media Research Section of the STOU Office of Educational Technology. The results of the study showed that 77 percent owned radios; 47 of the students percent listened to the radio programmes, and 77 percent thought that the time length of the programme was appropriate. Of the students 84 percent owned television sets, and 56 percent watched the educational programmes.

A further study on the STOU educational TV programming was conducted of the 8,371 students in the 1988 graduating class. The results showed that 91 percent were able to receive the television signals from Channel 11 and the substation; 80 percent still watched STOU programming. Of these, 81 percent watched them in their free time; 15 percent watched only programmes that interested them, and 2 percent watched the programmes daily.

In addition to its educational broadcasting services for students, including those in continuing education, in the last ten years STOU has produced some 786 radio programmes and 78 TV programmes for the general public, consequently, STOU is playing a role in the development of human resources through its multimedia system with an emphasis on broadcasting. Not only do the majority of the students use the educational programmes as supplementary materials for their course work, hold occupations, and are self-sufficient, but the public in general also has the opportunity to watch and listen to STOU programmes, using the knowledge they gain both in their vocations are daily lives. To show you that the programmes, especially the TV programmes, are beneficial both to the students and to the public, I will show you video samples. But before doing that, I will explain the contents of the sample programmes.

There are four programmes. The first programme was produced for the students in the School of Agricultural Extension and Cooperatives. The content is about water for cultivation: Where water comes from; how to use water for cultivation usefully and efficiently. The second programme was produced for the students in the School of Health Science. The content concerns maternal and child health, and family planning; What are the objectives and goals; how many agencies are responsible for these activities. The third programme was produced for the students in Liberal Arts: The content is how to use English for communication; to use English in their daily lives. This programme has two parts. The first part is on how to use English in daily life; and the second part shows how to use English for communication in the office.

Even though produced for the STOU students, the general public also have the opportunity to watch these three programmes, using the knowledge gained in their vocation as well as their everyday life.

The fourth programme is the Social Service programme, produced specially for the

general public. The content is folk songs of Northeastern Thailand — in Thai called "Pong Lang". The University hopes that when the public watch as this programme, they will get both knowledge and entertainment also, the programme will help to preserve and maintain this culture.

These sample programmes, will take about 8 to 10 minutes. Please play the video.

(Showing of video film)

That's the end of the sample programmes from STOU. I think most of you enjoyed these programmes and would agree with me that there are beneficial both to students and the general public. I think it may be for this reason that various governments and private agencies now accept STOU. Recognizing the value of the STOU programmes, these agencies have to requested these agencies develop joint programmes with university.

These agency include the Ministry of Agriculture and Cooperatives, the Police Department and in the private sector, the Bangkok Bank Limited.

In conclusion, it is generally accepted that developed and developing countries in this age of information will realize the importance of broadcasting and telecommunication in social development. Thailand encourages government agencies and educational institutions to take a leading role. However, broadcasting takes prominence over telecommunication. STOU has also assisted in the nation's social development by developing human resources and recommends that if broadcasting and telecommunication are to play an increased role, the government must have a clear and firm policy. That is, political leaders must be cognizant of the role of broadcasting and telecommunication as a communication and educational media in social development. There must be planning, an allocated budget, and an improvement of the communication mechanism so as to facilitate the raid and efficient development of the Thai society.

That concludes my presentation. Thank you.

Chairman: Thank you very much for your presentation. We should have had another channel for the interpretation service between Thai language and Japanese language. I am sorry for the absence of that interpretation service.

Those who have been involved in communication might well remember the fact that the use of communication for social development, academic has become a established domain. Communication does play a very important role.

Our Institution has a close relationship with the Thai Institution, STOU. Next month, some young staff members will be visiting STOU to conduct a joint local survey in Thailand. It is really a great pleasure for us to be have an able to welcome Professor

Nimpanich to Japan.

Now, the next speaker is Mr. Keith Harry whose institution is also very familiar to us. He will be talking about his work, documenting distance learning. I have heard his name several times, and it is really a great pleasure for us to welcome him in Japan. Professor Harry, please.

K. Harry: Thank you very much, Mr. Chairman.

It is a very great honour and pleasure to be invited to Japan to address this distinguished audience. May I thank the organizers most sincerely for giving me the opportunity to deliver this paper and to communicate with my colleagues and fellow workers in distance education.

My topic is the proper use of technology for the advancement of society, a very broad area. I address the topic from the viewpoint of an international distance education documentalist, based in the Open University of the United Kingdom, funded by grants from inside the United Kingdom and overseas, and working closely with many individuals and institutions in distance education worldwide, and in particular, with several international organizations concerned with distance education.

First of all, I intend to give you my own interpretation of the meaning of the phrases "proper use of technology" and "advancement of society" in the context of this paper. I will then provide some illustrations based on the experience of various distance teaching universities.

Secondly, I will describe briefly the development of two new major international organizations in distance education, the Commonwealth of Learning and the European Association of Distance Teaching Universities, both of whose work is closely linked with the theme of this paper.

Thirdly, I would like to describe the work of my own Centre, the International Centre for Distance Learning, which has a close working relationship with both of these organizations.

I am concerned today with the proper use of technology and the advancement of society. And I intend to take a very simplistic view of both concepts. To take the second phrase first, I equate "the advancement of society" with the promotion of educational opportunity to the greatest possible number of people. My interpretation of the phrase "proper use of technology" is not from the technical viewpoint, but from the viewpoint of appropriateness.

It is crucial, it seems to me, that technology in distance education should be employed in appropriate ways in order to achieve maximum effectiveness. I realize that the term "appropriateness" is capable of at least two interpretations in this context, in terms of the pedagogical effectiveness of individual media and in terms of

accessibility. While recognizing the importance of pedagogical effectiveness, my emphasis is on accessibility, particularly on the accessibility of distance education to students through appropriate use of technology, and on the accessibility of information to those people in different parts of the world who are responsible for providing distance education courses to students.

The concepts which the phrases "advancement of society" and "proper use of technology" represent, in my interpretation, have come together in the movement over the past twenty years towards the establishment of large distance teaching universities.

Countries with distance teaching institutions are: South Africa, the United Kingdom, Spain, West Germany, Portugal, Israel, Pakistan, Canada, Venezuela, Costa Rica, Thailand, China, Korea, Sri Lanka, the Netherlands, Japan, Indonesia, India, and Taiwan.

Most of these institutions in Asia, Europe, Latin America, the Middle East, and North America, have the objective of providing educational opportunities for adults, which are not available through existing, conventional higher education provision. All of these institutions have harnessed established, and where resources permit, developed technologies as teaching media, as supplements to teaching and student support. The same is true of many other institutions in all parts of the world, including Africa and Australasia, which operate distance teaching departments or programmes alongside on-campus programmes.

It is interesting to observe the changes which have occurred in older-established institutions in relation to technology over the last two decades, and to note how newer institutions are using technology to provide students with access to courses.

To take the Open University in the United Kingdom as an example, the first courses taught in 1971, and many later in the 1970's, had a television and a radio component to supplement the printed correspondence texts, which were, and continue to be, the principal teaching medium. Radio has to a very considerable extent been replaced in the University's courses by audio cassettes, while video cassettes are often used instead of television programmes. There are many reasons for these developments, including the rapid expansion of the University's programmes of courses, the decreasing amount of time available on national radio and television channels to the Open University because of the expansion of general programming, the comparative expense and rigid production schedules associated with television, and the popularity and potential flexibility of audio and video cassettes.

The logistics of introducing new technologies into an established system are considerable. The University constantly monitors new technologies and their potential applicability, and has recently, for example, introduced a course which contains a

computer conferencing component. This involves students communicating via a personal computer in their own homes and a mainframe computer on the University campus with tutors and fellow students in other parts of the country.

By contrast, the Open universiteit in the Netherlands, which began teaching five years ago, uses television very sparingly, and principally for advertising its courses, and does not use radio at all because no channel is available for the purpose. Study centres are equipped with hardware for students to use computer-assisted learning components in their courses. Because the Open universiteit started relatively recently, it has been able to benefit from the experience of older distance teaching institutions, and to make use of new technology much more readily than institutions with a strong commitment to older technologies. It has been particularly interesting to note the special emphasis placed by your own University of the Air on the use of television, following the establishment of the institution after many years of preliminary research.

Many factors, cultural, political and logistical, have been influential in the development of different mixes of media in the world's distance teaching universities. I would like to very briefly make a few comments on the media used in some of these institutions.

To begin with South Africa, nation now politically isolated from much of the world, there is a movement in the black borderline states to introduce a distance education network to serve students in those countries, and to remove their dependence upon the University of South Africa. The reason, apart from the political reason, for wishing to be separated from such dependence, is that the University depends primarily upon printed material and provides little additional support.

I would like to add three facts about the Open University in the United Kingdom where there has been a debate about broadcasting for several years. The first fact: It is possible to complete many Open University courses without watching TV or listening to radio programmes. The second fact: The high profile which the Open University enjoys in the United Kingdom is largely due to the University's public exposure on television. The third fact: Of the TV programmes watched by Open University students, only 9 percent are watched as they are broadcast. The remaining 91 percent are videotaped and watched later.

The Fern Universiteit in West Germany has, as one of its tasks, the job of designing innovative methods of teaching higher education. But the German academic tradition is firmly based in print. So, in practice, the print medium is almost totally dominant in the university.

The Allama Igbal Open University in Pakistan has had a particular problem since its inception. It has had very great problems in paying the high transmission fees demanded by the Pakistan Broadcasting Corporation.

The Central Broadcasting and TV University in China has always relied very strongly on television, but it is turning now more and more towards developing additional print materials.

The Open universiteit in the Netherlands has made use of peak viewing time for television. It has used advertising during the half-time break in televised soccer matches.

Universitas Terbuka in Indonesia is, I think, of particular interest since it has utilized satellite technology to help overcome some of the problems associated with a very scattered student population.

The most recent open university to be established is the Universidade Aberta in Portugal, which was established in 1988, and will shortly be offering its first courses.

In addition to these institutions, it is likely that distance teaching universities will be established in Bangladesh and in Tanzania. All of these universities are very very different. They all have very different problems. They are similar, in that they are autonomous, degree-granting universities. I have selected them simply because they are some of the largest of the institutions which are currently teaching and which are innovating in the use of new technologies.

Two new international organizations have recently been established which are centrally concerned with the impact of technology on distance education. The Commonwealth of Learning was set up in 1988 by the Commonwealth Heads of Government, with its Headquarters in Vancouver, Canada. The organization will work in three ways to serve the 49 countries of the Commonwealth, the majority of which are in Africa, Asia, and the South Pacific. The 49th country, Pakistan, has rejoined the Commonwealth since I wrote my paper.

The objectives of the Commonwealth of Learning are:

No. 1: To promote, encourage, and arrange the sharing of distance teaching materials and support the development of new materials to meet common educational needs;

No. 2: To help support distance teaching institutions through staff training, through improved communications, through an information service about distance education, and through programmes of evaluation and research;

No. 3: To help distance teaching institutions to provide better services to students by facilitating the exchange of credit and, where possible, working with institutions to improve study support systems.

The European Association of Distance Teaching Universities was established in 1987, and now has 13 members in 12 European countries. The countries involved are: Belgium, Denmark, France, West Germany, which has two members, The Republic of Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and the United

Kingdom. Five of these institutions are distance teaching universities; I have mentioned each of these already. The majority of the remainder are consortia of institutions, some of which are educational institutions, some of which are commercial organizations. This particularly applies in the Italian consortium, which includes the computer manufacturers, Olivetti, as one of its partners.

The major areas of interest of the European Association are course and credit transfer, long-term developments in distance education, the teaching of languages, and the use of technology. One of the most interesting projects in the area of the use of technology is a proposal to develop a satellite link between the member institutions of the European Association. This is designed to facilitate day to day communications between member institutions, and also to assist in possible joint course development projects.

Finally, I would like to say something fairly briefly about the Centre which I run, the International Centre for Distance Learning. Our Centre has been involved with the European Association of Distance Teaching Universities, since its establishment. We have been involved in the production of a membership directory, and the production of a preliminary version of a catalogue of European distance taught courses. This is an interest which the European Association has in common with the Commonwealth of Learning, which also has as a priority the establishment of a data base of distance taught courses. This is an area where the International Centre for Distance Learning will also be involved.

I believe that a similar interest is shared by the Asian Association of Open Universities, three of whose seven members, the Indira Gandhi National Open University in India, the Alama Ikubal Open University in Pakistan, and the Open University of Sri Lanka, are located in Commonwealth member countries.

Our Centre, the International Centre for Distance Learning, was originally established in 1978. It has been funded since 1983 by the United Nations. University here in Tokyo. Its collections are of two kinds: Documentation and computerized databases. We specialize in collecting information and documentation on distance education in countries worldwide. And we offer an information service, which is based upon these resources.

It is very much my hope that we will be able to cooperate in the future in a fruitful way with the University of the Air, which I know shares a number of the interests of the International Centre.

I am conscious that I have left out a good deal of information which I intended to convey. I have taken a great deal more time than I anticipated. Let me conclude by reiterating that it has been a great pleasure to have the opportunity to talk to colleagues. I would very much welcome the opportunity of talking further with you,

and I hope that this will be the beginning of a fruitful cooperation with your University.

Thank you very much.

Chairman: Thank you very much, Professor Harry.

We have the text of Professor Harry's presentation. I am sure there will be many questions, and we will have an opportunity to ask them during the Reception and also tomorrow during the overall discussions. So, we would like to move on right away to the presentation by Professor Henningham.

Professor Henningham is not necessarily an expert on distance education, but rather, specialist in communications and journalism. Professor Henningham will be taking a critical position against a kind of education that uses various media, and we are very much looking forward to his presentation.

J. Henningham: Thank you very much.

I would like to thank the University of the Air and the Institute of Multimedia Education for the opportunity and privilege to be here, and my particular thanks to Professor Koda, and to you, Mr. Chairman, Professor Kato, with whom I had the privilege of working on research at the East-West Center, Hawaii, some years ago. This is an opportunity for me to return to Japan where I was a student on a Mombusho scholarship some twelve years ago. And this is the first time I have been back to Japan so it's a very special experience for me.

I would like to talk about television, and my topic is "Television versus Educational Values". And in some respects, as Professor Kato indicated, I will be offering various criticisms of television as a tool for education. It was only when I came to the University of the Art and the Institute that I realized how central a part television has in the Open University of Japan. And if I had been aware of this, I may have had a slightly different topic; — perhaps talked about the dangers of some other medium. But it's too late. So, I will launch into this.

A decade has now passed since the publication of Jerry Mander's detailed critique of the use of television in modern society. Mander, who provocatively titled his work "Four Arguments for the Elimination of Television," said:

"I finally faced the fact that television is not reformable, that it must be gotten rid of totally if our society is to return to something like sane and democratic functioning."

Of course, Mander did not believe that what he proposed was really feasible, that television could be banned. Yet he argued that it was essential to at least plant the seed, that television was so intrinsically bad, that people should at least begin considering the idea that they should get rid of it.

According to Mander, television harmed people in the way it mediated experience,

and the way it colonized experience. He had particular contempt for the crass mass salesmanship of television through advertising, and for the slick and silly entertainment shows which waste people's time. He also condemned the direct effects on people's physical and mental health caused by over-exposure to television.

But Mander is perhaps most critical of the adverse effects of television's more serious content, including news, documentary programmes, artistic shows, and educational programmes. He refers to the dominance of images, to the emphasis on the vivid and the dramatic, to the avoidance of subtlety and context.

Of course; Mander was not taken seriously. His attacks seemed too broad and undifferentiated, his remedies too extreme and unacceptable.

Only a few years ago, another general attack on television was launched, this time by Neil Postman. In his book "Amusing Ourselves to Death", Postman painted the picture of modern society being destroyed. He argued that the destruction was not at the hands of external, visible aggressors, as in George Orwell's "Nineteen-Eighty-Four". Rather, society was going the way of Aldous Huxley's "Brave New World" — being destroyed by enemies within, such as mindlessness and boredom. As a radical educator, Postman is particularly critical of the impact of television on diluting the traditional values of education.

According to Postman, the curriculum of the school and the curriculum of television are entirely antagonistic. He argues television's contribution to educational philosophy is the idea that teaching and entertainment are inseparable. And I will quote from Postman:

> "This entirely original conception — teaching and entertainment are inseparable — is to be found nowhere in educational discourses, from Confucius to Plato to Cicero to Locke to John Dewey. In searching the literature of education, you will find it said by some that children will learn best when they are interested in what they are learning. You will find it said: — Plato and Dewey emphasized this —That reason is best cultivated when it is rooted in robust emotional ground. You will even find some who say that learning is best facilitated by a loving and benign teacher. But no one has ever said or implied that significant learning is effectively, durably and truthfully achieved when education is entertainment."

Postman, in fact, suggests there are three basic commandments forming the basis of educational television:

The first one, No. 1: Thou shalt have no prerequisites. The fact that each programme is a self-contained package means that television is a non-graded curriculum. Postman says: "In doing away with the idea of sequence and continuity in education, television undermines the idea that sequence and continuity have anything to do with thought itself."

His second commandment, No. 2: Thou shalt induce no perplexity. He says: "There must be nothing that has to be remembered, studied, applied, or worst of all, endured. It is assumed that any information, story or idea can be made immediately accessible, since the contentment, not the growth, of the learner is paramount."

The third commandment, No. 3: Thou shalt avoid exposition. He says: "Arguments, hypotheses, discussions, reasons, refutations, or any of the traditional instruments of reasoned discourse turn television into radio, or worse, third-rate printed matter." "Thus," he says, "television teaching always takes the form of story-telling, conducted through dynamic images and supported by music." "Nothing will be taught on television that cannot be both visualized and placed in a theatrical context."

It must be emphasized that Postman is speaking exclusively of educational television programmes made for broadcasting to a general audience. He is not referring to the use of television modules within distance education courses. So, I do not suggest that the form of teaching of the HOSO DAIGAKU is in any way in keeping with Postman's commandments.

Yet, the criticisms he makes of the values inherent in educational television can surely be applied to most forms of televised instruction. The technological imperative of constructing a programme that looks good, that meets the conventional criteria of effective television by centering on visuals with much editing intervention, results in an over-commitment to the standard techniques of television with entertainment as the hidden curriculum.

As one British distance educator has pointed out, broadcast television or radio remains the easiest way to reach students or potential students. And he says that it has the major advantage of being entertaining and attractive. Thus says this educator: "It helps recruitment and motivation." If this is the best reason for using television in distance education, it hardly seems worth the considerable investment.

Among distance educators, there are different views on the effectiveness of television and other broadcast media as teaching instruments. James Taylor, for example, stresses the limitations of broadcast media as a cost effective way of teaching, particularly for developing countries. Taylor's major concession to the use of television was that from a student point of view, it may be useful to have a variety of instructional media available in order to meet the students' individual preferences.

David Sewart makes the point that an instrument like television is a tool of teaching at a distance, not necessarily of learning at a distance, because of its non-interactive nature; — the one-way communication inherent in television.

Elsewhere, attempts have been made to analyze the pluses and the minuses of different instructional media in distance education. Thus, Tony Bates has suggested a range of strengths and weaknesses associated with the use of broadcast television in

education. On the good side, he suggests television can help in the following eight points:

— Encouraging individual interpretations;
— Stimulating creative thinking;
— Providing an overview or synthesis;
— Narrative and story-telling;
— Demonstrating continuous processes;
— Modelling learning processes;
— Raising awareness; and
— Developing skills of evaluation.

On the other hand, suggests Bates, television is bad for the following seven points:

— It's bad for developing masterly learning;
— It's bad for feedback or self-evaluation;
— It's bad for analysis; — analysis of process or analysis of situations;
— It's bad for storage of information;
— It's bad for reflection or deep processing;
— It's bad for the presentation of complex ideas; and
— It's bad for the development of abstract thinking.

He cites research indicating that British Open University students have had difficulties using TV programmes of the documentary form in the way intended. In addition, from an educational perspective, many other difficulties are involved. According to Bates, "for the learner, learning from broadcast television is a difficult process. Students will need a lot of skill in using broadcast television for educational purposes. The programmes themselves need to be structured in ways that help the development of such skills, but making programmes this way tends to be contrary to the production styles generally used in educational broadcasts."

Elsewhere, Bates cites the view of Postman that "the predominant influence of television in our lives is moving society away from valuing objective, scientific, rational thinking, to giving greater importance to impressionistic and intuitive thinking," although Bates himself believes that television can stimulate creative thinking.

But he finally concedes: "Basically, no one knows. Everything may be possible, eventually, through technology. But we should ensure that what is done through technology is what we want, no less in distance education as in any other aspects of our lives."

Greville Rumble has recently emphasized how the technology of distance education can be misused by governments to achieve their own ends. And he has cited examples from South Africa, Iran, Colombia, Chile, and Sri Lanka, to show that repressive governments can, in particular, benefit from teaching programmes where

the students are kept isolated from one another, and have nowhere to gather together physically.

While all educators should be aware of such problems, perhaps the dangers facing us in modern democratic societies are not of the Orwellian dimensions of the authoritarian state. Rather, as Postman has suggested, they may be of the Huxleyan variety.

Perhaps the greatest danger of using television for educational purposes is that it completes for students their socialization into acceptance of television as totally beneficial. Use of television as a tool by educators conveys the clear message that TV is indeed a respectable medium; and perhaps suggests that television is as useful and important as the printed word in conveying information and argument.

The philosopher, Allan Bloom, in his influential book "The Closing of the American Mind", has bewailed the modern student's loss of understanding of the printed word, and in particular, a loss of the traditional use of and reverence for books. How obvious it is that television is largely responsible for modern students' failure to read!

Similarly, those of us concerned to develop students' writing skills are constantly appalled by their inability to write, including a lack of basic skills in spelling and grammar. Again, television can be blamed.

But we cannot blame an object. We cannot blame the technology itself. We must focus the blame on those of us who use and promote the technology. This is where we educators, who use television as a teaching tool, are particularly vulnerable.

One cannot realistically expect television to be eliminated, even from our classrooms and open universities. But if educators are committed to television, they have a particular obligation to educate themselves about the medium, and to pass on this knowledge to their students.

Postman seems to see little hope in the education system effectively teaching students about the media. He says: "Our schools have not yet even got around to examining the role of the printed word in shaping our culture." It's the very principle of myth, as Roland Barthes pointed out, that it transforms history into nature, and to ask of our schools that they engage in the task of demythologizing media is to ask something the schools have never done.

Yet, my own experience is that students at tertiary level are interested and fascinated by having the techniques of television revealed to them. I have found when discussing the production techniques of television news that few students in this television-dominated world are initially aware of the various methods such as the "cut-away" or the "reverse" or the "two-shot", the "noddy", or other standard TV techniques that are used to reconstruct reality. And I will explain the meaning of any of those terms for those who aren't aware of them. But the students are greatly

interested in finding out how these methods are used. And their television-viewing is, I believe, enhanced as a result. They learn the tricks and the techniques of reconstructing a reality, and I think, obviously understand the medium far better.

Hence, I argue that education is a very important way of preparing students for lives in which so much of the information presented to them will be through the television tube, as Professor Morrison suggested earlier.

My essential point is that if we, as educators, insist on continuing to use television for educational purposes, we have a purposes, we have a particular responsibility to educate our students about television. Indeed, I suggest that courses on the social impact of modern technology should be a compulsory part of distance students' education.

Postman suggests without much conviction that educators can address the problem of television. As he points out, educators are not unaware of the effects of television on their students; but that much of their consciousness centers on the question: — how can we use television, to control education? They have not yet got around to the question: —How can we use education to control television?

If we truly believe in the importance of life-long education, it is our responsibility to ensure that we do use education to control television.

Thank you very much.

Chairman: Thank you very much for a very philosophical as well as provocative presentation. I think we were given a good stimulus for our discussion later. And I also think, that your not knowing very much about the University of the Air was in fact a plus for us, because it will stimulate our discussion.

Next is Mr. Koda.

K. Koda: This morning we received a very distinguished keynote speech that was presented by Dr. Morrision. And earlier we heard from Dr. Harry saying that he was interested in seeing the activities of the University of the Air. And Mr. Henningham said that he had some questions or doubts about the educational merit of television. And may I say, I am an individual who is open to the opinions of others. So, in my disourse today, in talking about the issues being faced by the education system in Japan, I will preface my remarks by saying; — and I was reminded by our Chairman earlier that, first of all, my text — I gave my original text too late, and thus troubled my translator; therefore, for instance, the numbers are not properly indicated in the English version. So, I will try to make each point clear as I show each diagram.

So, let me first talk about the higher education system in Japan. The figures on the diagram may be too small for you to see. This depicts the percentage of high school

students going on to university. In 1970, it was 24 percent; in 1985, it was 37.6 percent, in Japan. And in the United States, the ratio is about 43 percent. In Europe, the percentage is between 20 to 30 percent. So, we can say that the percentage of students going on to university level education is rather high in Japan. But, in 1955, the same percentage was only 10.1 percent. And it was, as I said, 37.6 percent in 1985. And in the past ten years or so, the ratio has remained stable at about 37 to 38 percent.

So, our ratio is still lower than that of the United States, but higher when compared with the figures for the European countries. That's the rough comparison that we can make. But this ratio, about 40 percent of students going on to the higher education; — whether this ratio can be said to be high enough for Japan in our own context is a different question. Just because the number here is high does not mean that the students in universities in Japan are very studious.

NHK has conducted a survey, and the upper bulk shows the high school students; which reveals how high school students are using their time during the day. The lower bulk is for university students. And it clearly shows; — what is clearly seen here is that the college students do not spend much time for studying purposes at all, in comparison with high school students.

So, then, we have to analyze why is it, then, that many high school students — in such a large percentage — are going on to universities. Japan Sociological Society has conducted a survey in 1955, 1965, 1975, and 1985; — at each ten year mark; — entitled Social "Stratification and Social mobility." Based on the results of this survey done in 1955 and 1985, I have compared the academic background of the three generations; grandfather, father, and son. The survey only looked at the male members of the family.

At the top is information for 1955; the bottom is information for 1985. And a rough conclusion from this is, as encircled, in 1955, that there was sort of a bipolarization between a family, in which both grandfather and son only went to the elementary or the junior high school level, or the two generations going to the university level. That was in 1955. But in 1985, there are three clusters; — those graduating from high schools or from junior high schools, or from high schools and from university.

What this means is that in 1955, there was, as it were, a recycling of the generation, in that if the grandfather went to a certain level of school, the son or the grandson also went to the same level of school; whereas in 1985, the younger generation went to a school which is one level above that has been intended by his father or grandfather.

In 1955, 68 percent of the household showed that both, or at least, two generations of the family having the same level of academic background; in 1985, the ratio was only 21 percent. And in 1985, the ratio for three generations holding the same academic background was 36 percent and its ratio is much smaller for 1985, 6 percent. And in fact, in 1955, the ratio for the first and second generations have lower academic

background and the third generation has the same level of education was 80 percent, but in 1958, it was 14 percent. And in 1955, the ratio for the first and second generations have higher academic background, and the third generation also attain higher education was 65 percent and in 1985, it was 86 percent. So, in comparison between 1955 and 1985, we can say — the higher the second generation's educational background was, the higher the third generation member of family's academic background became, regardless of the level of education by the first generation member of the family, namely, the grandfather.

This was a study done by Ms. Kataoka. And she borrowed this word from Robert Merton, who advocated this so-called "Matthew's effect in Science", and she tried to look at Matthew's effect, whether such an effect exists in terms of academic background. She concluded that there was such an effect in 1955, but there was no such effect for 1985. In other words, the effect says that in a family where there is a tendency for members to attend higher education, then, obviously, the third generation member went up to an even higher level of education. In fact, this effect was not seen in 1985.

If this is not the trend in Japan, what are the factors to support the high attendance in universities in Japan? This dates from 1979, looking at our society, this survey asks the question: Who would you evaluate highly, or who do you think the society would value highly; — those with better degrees — higher degrees, or those with better competence or ability? And the conclusion was that people tended to believe that our society gave high marks to those who have higher degrees. This may be the reason why that a large number of high school students go on to university level education. And people still believe in the myth of the importance of academic qualifications.

So much for our situation in terms of higher education. We used to have a correspondence educational system that did not rely on television or radio broadcast programmes. That was before the University of the Air was set up. And the university level of the correspondence courses began in 1972, and the junior college level correspondence courses began in 1976. There are twelve private universities and 10 private junior colleges, plus the University of the Air, which was added later, offering a correspondence type education.

So, looking at only the private institutions offering correspondence courses, setting aside the programmes being given by the University of the Air; — let's take a look at the number of students. I will not cite the specific numbers-figures. But in 1985, there were about 64,000 students. And the number of students graduated in 1985 was 5,720. So, the number of people graduating from this correspondence type university education, was at 5,700, or about 1 percent of all the students who went on to university level

education. Ratios were 7.8 percent of the students who were originally involved in the correspondence courses of the university level education and 48.9 percent for the junior college level education.

Now, we will take a look at the student's motivation for taking correspondence type university education. They were involved in order to obtain some qualifications for the occupational purposes or to obtain information and kr owledge to be used in their occupation; 40 percent. And students who said to obtain a college degree or to enhance their academic interests have both 22 percent. And 35 percent of these students were college graduates or university graduates. And in this case, the mode of communication was by mail or telephone, and printed materials. Radio or television came in only more recently.

So, when we studied these students who took courses through correspondence, and according to the results of the survey, non-correspondence traditional course, when they were asked whether they thought the traditional colleges/universities were open to our society, 55 percent said yes, and 40 percent said no, the traditional colleges/universities were not opened. But they felt that correspondence colleges/universities represented the openness of university level education, because 70 percent of the people answered that they felt that correspondence colleges/universities represented the openness. But when I asked whether the correspondence colleges/universities were given high regard in our society, unfortunately, the answer was that only 25 percent thought that the evaluation the society gave of the correspondence colleges/universities was high. 63 percent of the respondents said the evaluation was not high.

So, in comparison to traditional college/university education, even today people tend to believe, according to this survey, that what they are attending, the correspondence type of education system, was not regarded too highly in our society.

The University of the Air makes use of television and radio programmes. Dr. Harry stated that in our case, we were able to spend a long period for preparation. In fact, 15 years for preparation, before we actually initiated our programmes. The reason we had to spend 15 long years had to do with problems related to Japanese government's educational policies. But aside that, I would personally think, firstly, that technological innovation, which is one of the subjects today, I believe, delay in our adapting to technological innovation was the reason for this long preparation. And another reason was that people still was bound to emphasize or attach themselves to traditional way of higher education. This sort of bias was the reason for the delay.

In any case, at the University of the Air, now we have 26,000 students. We are the Liberal Arts university, and offer six majors. We will show you a video later; so I will not go into details here. But there are general education courses and specialized courses.

But there are no courses that are offered to those who would like to obtain a teacher's certificate — teaching certificate.

As student classifications, there are Regular Students who are pursuing for BA degree, and Non-Degree Students who are enrolled for one term or one year, and anyone over the age of 18 can be enrolled to study at the University of the Air. There are eight Study Centers. And in the spring of this year, in 1989, as I said, some 7 percent of the original enrollees were graduated.

The issues for us are, for one thing, that our broadcast programmes reaches only the Kanto area, the vicinity of Tokyo. We would like to see a better reach, it means the nationwide network of our programmes. And there are various difficulties involved when the University of the Air is to offer broadcasts throughout Japan. Dr. Muta has calculated what would be the cost that will be required. But before the questions of the cost, expenses, investments; and as he pointed out that our university system is more expensive in its cost than regular universities and he also stated its cost is equivalent to science departments in national universities. Since 1985, we have been conducting surveys annually on our students, helped by Professor Iwanaga, our Associate Professor.

And the results of our annual survey, in part, show, as you see in this bottom half, though numbers are small, 77 percent wanted to improve the level of knowledge of the area they were interested in. 63 percent wanted to obtain university degree; and 60 percent wanted to join the University because they can study home.

Which lecture or which course students felt the most useful; — asked this question — for TV lectures and printed text studies, students gave high marks, whereas the guidance by correspondence and radio lectures were not rated very highly by the students who took them. In many cases, video cassettes or tapes — cassette tapes are used.

In our case, we offer some 300 courses altogether. And there is a 50—50 breakdown between radio and television. And we conduct credit certification examinations on each of the broadcast programmes. And those examinations are divided into multiple choice type and descriptive writing tests. And what we have found out as a result of conducting these two types of examinations is that, in the use of TV, selective or multiple choice type gave a better result, whereas in the case of radio programmes, students did better with the descriptive written examinations.

So, it seems that television, even though there is high expectations placed on television, may not be a media that gives students an ability to write or ability to think through. And that was an impression I obtained from those results. So, this is how things stand at the moment. And I think I should be giving some of the concluding comments.

Having said all that I have said, as Dr. Morrision was saying, there is a technological innovation on one side, and there is life-long education or learning. And adaptive learning system was something that bridges the two, he said. And he gave us his iron rules of goals, one of which I understood was that we must avoid mythicism. In my own way of translating what he was saying was that the ultimate logic of life-long education lies in our being able to identify mass market. And for individual students who seek for life-long education, their needs must be grasped, and education must provide a type of learning that will meet their unique needs, though we are looking toward the mass based market.

And I do agree with what Dr. Morrision was saying this morning, and at the same time, I feel that the kinds of technological innovation we see are important in their own rights. But we must look back thirty-forty years ago where there were scientific revolutions. And thirty or forty years ago, were the universities able to adapt to those scientific changes? I think universities were not able to keep up with the scientific revolution three-four decades ago.

The "Technology Academics" written by Dr. Ashby is a book which was written thirty-five years ago. He said: The specialist studies of college/university level had to be included in liberal education, and there was a need for revising the thinking that we bring to liberal education. And time now is such that we have to once again heat the opinion of the writer of this book. Science and technology are different, but technology is something that requires a close linkage or connection between man and society. Therefore, education in technology is indispensable. Particularly, in the case of the University of the Air, which is a distance education institution, we must be able to incorporate the study of technology in our curriculum.

This completes my remarks. And with your permission, I would like to show you the video about our University; —the latest video that we have developed. Thank you.

(Showing of video film on The University of the Air)

Chairman: Thank you very much.

Since we received many presentations and reports, I am sure there are many questions that you would have on your mind. At the same time, we have two discussants with us. Since we have had a very intensive session, we would like to take a thirty minutes break. And we shall resume our meeting at 3:40.

Thank you.

Secretariat: The coffee and green tea are served in the foire. Thank you.

(Coffee Break)

Chairman: Now, ladies and gentlemen, we would like to resume our meeting. Since we will be having another event after this, we would like to keep an active discussion within a confined time.

First of all, we would like to invite our discussants to make some comments on the four presentations. Although "discussants" may sound like they are going to make long speechs, I would like them to confine their presentation to ten minutes so as to allow time for active discussion afterwards.

Professor Nasu is a Professor at the University of the Air whose major field is earth science. Next to Professor Nasu is Professor Kikukawa of the National Institute of Multimedia Education. Professor Kikukawa is engaged in the development of a visual imagery database which I think is very unique in the world. I do not fully understand what it means, but with the pressing of some buttons, something very strange comes on the screen.

Now, I would first like to invite Professor Nasu to speak.

N. Nasu: Thank you for your kind introduction. I appreciate this opportunity very much.

We have just heard very enlightening presentations, and some incisive views, from four panelists. The overall topic is the distance education through broadcasting, telecommunications and social development. As you have just heard, the four panelists based on their specialities and experiences have brought forth a very incisive and deep presentations, with many insights. Therefore, rather than summarizing what has been said which I have to say is beyond my depth, my major field is earth science; I would like to refer to my speciality, earth science, and try to relate this field to the topic of distance education through broadcasting, telecommunications and social development. Consequently, I would like to select one or two topics from my speciality.

Yesterday, as you all know we received the news of a major earthquake in San Francisco. When I was reading the newspaper in the hotel this morning, the newspaper account said that the reason for that earthquake was the San Andreas Fault. The earthquake was caused by the tremor in the longitudinal direction. When such tremors take place in Japan, it is because of the stress accumulated in the Pacific Ocean plate, submerging into the earth's crust right beneath the Japanese Archipelago. When the stress reaches a certain point, it tries to take the remedial movement. Consequently, if anything happens, in case of Japan, it will be the tremor in the vertical direction rather than the longitudinal direction.

Twenty years ago, such a precise explanation of earthquakes would not have appeared in any newspaper article. It would have been almost impossible. During the past twenty years, however, a lot of knowledge and insight have been gathered about

the phenomena and the facts of the Earth which makes possible such an article. Also, the TV stations — NHK and others — have been giving interpretation and explanations of the phenomena, together with live broadcasts from the scene of events.

When I was a student in the university, it seemed that the Pacific was an ocean of eternity and calmness. Indeed, it has been the ocean of eternity for as long as 3,800 million years. However from 1961 to 1962, there was a theory concerning the expansion of ocean bed. It was proposed by an American scholar that the ocean bed of the Pacific expands or moves to the degree of 2 centimeters to 3 centimeters per annum. This was an entirely new idea. As a result, the San Andreas Fault was understood as moving across to San Francisco, upward in a northern direction and the western and eastern block goes downward in the southern direction. This was discovered by a Canadian professor, Professor Toldo Wilson.

A few years later, from 1967 to 1973, it was noted that the surface of the earth's crust was moving at the rate of a few centimeters per annum. This crust did not have the thickness of 10 kilometers, but a much thicker plate of about 100 to 200 kilometers. Therefore, the very famous "plate tectonics" was developed — a term that is very often referred to in TV news, radio or newspaper. These earthquake phenomena are now frequently interpreted in terms of "plate tectonics."

In 1923, there was a great earthquake in Japan's Kanto area. At that time, the reason for the phenomena was not fully elucidated. After the advent of the theory of the expansion of ocean bed and plate tectonics, the cause of the great earthquake in Tokyo in 1923 was clarified.

The reason why I am going into length on these matters is that, when I was a student in university, no such explanation was given at all. Today, in a lecture at the University of the Air, detailed explanation is given to the students. Therefore, the graduates of the universities of my generation can re-educate themselves by enrolling in the University of the Air. By following the lectures of this University, they can gain knowledge and insight concerning the outcome of the latest academic research.

Distance education makes it possible to learn more about recent outcomes of recent studies. I believe this is one expression of social development which is one part of our topic this afternoon.

People in their thirties, forties and fifties are very busy, and they do not have time to go back to the universities to study these matters again. However, by listening to the lectures of the University of the Air, they can gain knowledge and follow the new developments of society and academic research, even though they may not enroll themselves as regular students of the University. Of course, the regular students gain systematic knowledge about these matters.

A very eloquent example of this is that out of the graduates of the first class, who

graduated this year, more than 50 percent of them re-entered the University again. As President Koda, mentioned, there are six majors or disciplines in our University. Those graduates who have completed one of those majors, may therefore decide to learn the natural sciences, taking another two years after graduating from the first subject they mastered. This is a new tendency we have observed.

Professor Henningham points to the pitfall of the use of TV, a danger of which we are aware. We appreciate the caveat he sounded. At the same time, these programmes are very attractive, so much so that more than 50 percent of the graduates decided to re-enter the university.

As a consequency, those of us faculty and staff working at the University of the Air are dedicated to pursuing our academic fields to expand our knowledge with new achievements; but at the same time, we want to convey and disseminate that knowledge at large to the public.

With this, I should like to conclude my remarks. Thank you.

Chairman: Thank you very much, Professor Nasu. It seemed as if you were representing the graduates of the University of the Air.

Professor Kikukawa.

K. Kikukawa: Thank you very much. Mr. Kato has referred to what I am doing as something very difficult to understand.

I would like to try to teach him what I have thus far been doing, and what this Institute has been doing.

When we look at today's programme, this discussion time is entitled "Summary", and in the English version, we are referred to as "discussants". We weren't quite sure —Professor Nasu and myself — what we were supposed to talk about. So we decided among ourselves, that I would act as someone who would ask questions. So, I will limit myself to asking questions in regard to today's theme.

We have listened to various presentations during the morning that enhanced and deepened my understanding of the theme. I had thought I didn't like to study that I was not the type of person who really liked to study. After having listened to various presentations, however, I have changed my mind. I think I rather like studying, because when it comes to subjects I like, I work hard and study a lot. Whatever interested me was appealing to me.

There were some points today which interested me very much. "Active learning" was the phrase used by Dr. Morrison. The presentation on STOU in Thailand referred to the fact that through an open university or the University of the Air, people in a population can become more active. And Professor Harry said that information

technology can enhance access to education. Today's theme, "Technological Innovation and Life-Long Education", and "Broadcasting, Telecommunication and Social Development", — broadcasting and telecommunication, these are two different things as far as functions are concerned. Computer utilization of networks does remind us of the difference that does exist between broadcasting and telecommunication.

Professor Harry said something about the collection and offering of information concerning distant education or universities, — information concerning the type of education, the support in favour of the teaching staff, the content of the education and the accessibility to the public. These are issues which all have to be borne in mind.

I would be very happy if I can have a comment concerning this aspect of information. Various types of information have to be given to potential students, I understand.

Chairman: Who is ready to respond to that statement or question?

K. Kikukawa: Professor Harry and Mr. Henningham talked a great deal about TV telecommunication versus broadcasting, what is the type of relationship that exists between the two? Are they complementary of each other, or do they compete with each other — broadcasting and telecommunication? That is my question. — (*Recorded in Japanese*) —

Perhaps Dr. Henningham could give us some additional comments, especially because he criticized the communication aspect earlier. Dr. Harry could give us a general sort of a response to the question?

K. Harry: Would you mind repeating the question, please?

Chairman: — (*In Japanese*) —

K. Kikukawa: Yes. Broadcasting and telecommunication; — I believe the two are functionally different things. If my assessment that broadcasting is different from telecommunication is communication is right, what are the differences between the two? May I invite your comment on that?

Broadcasting and information network are different.

K. Harry: Yes. Let me see if I can carry things forward a little further.

I didn't mention the fact that there is quite a great reliance now being placed upon the use of telecommunications network for informal communication between institutions. In fact, during the tea break I was asking our colleague at the University of

the Air if he is available on the BIT system, the electronic mail system. I understand that he is. We use electronic mail both within the Open University and internationally to quite a considerable extent, both for informal communication and also in some cases for the transfer of documents.

As far as this seminar is concerned, we made a lot of use of another telecommunications device, as it were, the fax machine. We also use electronic mail quite considerably.

It seems to me that there will be some development in the area of computer conferencing, which is a system which relies upon telecommunications for teaching. Only 9 percent of the O.U.'s TV programmes which are broadcast are actually watched live. Maybe that's the point which you are picking up.

I think that this will probably result in future consideration of transmitting programmes on TV during the period when there is no general programming — during the night —, effectively. I think that's probably what will be the development. I maybe a little cheaper for the Open University to do that.

I am not sure at all that I have answered your question, but I have tried.

Chairman: Thank you. Then, Dr. Henningham, please.

J. Henningham: Thank you for those comments.

I think the point must be made that television will always be with us, and it will always now be part of education. However, there are two separate areas to consider: One concerns the nature of television within society, and the other the use of television in education, giving television more or less the endorsement, or the blessing, of the teachers — teachers saying: "Well, television is good." This will lead students, the citizens of the future, to believe that therefore television is good in all respects.

Other aspects of society which are negative are not generally used by teachers. They don't generally hand out cigarettes to children, to students, or give them whiskey, or drugs, or whatever; but they give them television. And so, anything that teachers present on use as a means of teaching is accepted subconsciously by students, whether children or adults, as being a good thing. And so, they come to believe that television is good, and never think to question it; — never think to question the impact it has on their lives or their own children's lives, the way that it takes over so many aspects of their lives. And I think it's important for educators to be aware of that.

But when you move from the general effects of television in society to the question of television within education, there is a different set of issues. And I think we would all agree that television needs always to be supplemented by other materials. And I realize that although a great use is made of television at this University, it is always in

conjunction with other materials, including written materials and with students attending classes, and having that face to face contact. Because one of the great failings of television as a means of teaching is that there isn't an interpersonal contact. And teachers who are talking simply to a television camera do not have their students looking back at them and giving them direct feedback, which allows them to modify their lecture in some way. And that's a limitation of television.

There are potential benefits of television. I was having a very interesting discussion with Professor Alfonso during the break, and he was discussing the problems with the use of television in language teaching. He suggested that perhaps with the techniques of the superb Hollywood directors who can really make a feature film, do things with television that you can't imagine conveying an impression to you that it is not what you can actually see, but it is what you cannot see getting directly into your mind using techniques of great professional skill and imagination.

If these sorts of resources could be tapped, then, perhaps television could really take leaps and bounds in the educational area. I hope that later, during the discussion, Professor Alfonso may be able to comment on this a little further.

So, thank you very much.

Chairman: Thank you. We have some fifteen minutes left. I would like to receive as many reactions from as many people as possible, but time-wise, I think I can allow only three questions. Again, I can allow maybe three people. Yes.

Would you please speak into the microphone — approach the microphone?

(Floor): I have a comment to address to Prof. Henningham. I wanted to preface my guestion by saying that I agree that as educators we have a responsibility to be very critical of ourselves, of the media we use. And that includes the printed word. It includes television, radio, computer assisted language.

I also believe that what Postman says in his book "Amusing Ourselves to Death" is fundamentally correct. However I disagree in the extension of argument to our use of television in distance education. I think I am on fairly safe grounds making that comment, because I come from an institution which makes very little use of television.

My difficulty is that I believe that there is a fallacy in the argument. And it goes as follows: That because commercial educational television has serious negative implications on society, and on our ability to think and develop as individuals, it follows that our use of television in distance education does the same.

To me what we are talking about is almost killing the messenger because we don't like the message. It's similar, by extension, I would say, that having had many very negative experiences in a traditional classroom, we ought to abandon rhetoric. We

ought to abandon standing in front of a class and lecturing. Although I may be over-emphasizing my point, I think that is a logical extension of the argument.

Surely the question ought to be how can television as a medium improve what we are doing, in teaching, and hence the ability of our students to learn.

In my own field, language teaching, there are many uses of television, whether it's at a distance or whether it's in a classroom, which simply cannot be duplicated by an instructor or by the printed word. I think of the use of television to enhance and to bring the culture and the everyday situation of a foreign country and culture into the classroom and into the minds of the students. Those types of use of television, for me, are pedagogically sound and pedagogically have an advantage, which printed word or other media may not have.

I would like us to be critical of everything we do in distance education, and to look for the best medium for the purpose that we are engaged in, which is better educating our students.

Chairman: Thank you. John.

J. Henningham: I agree. I think this is correct, that all media which we use must be subject to evaluation and examination and criticism. And this is very true.

I use television myself in teaching, in classrooms. One thing I always notice with television is that whenever you come to a segment where the television monitors are turned on, the students always seem to relax, and there is an air of excitement and interest that has a motivating effect. It's probably because since childhood, or since they were babies, television has been a form of entertainment. So, once the television is turned on, they seem to move into a different mode. And that doesn't have to be a bad thing. The whole purpose of education is variety and changing the situations of teaching.

However, I suppose my main point is that we must be in control of television. We use it for the good things that it can do by bringing pictures into the classroom that otherwise couldn't be brought to the attention of our students. But we must do it where we are the masters of the situation, and the television is not the master of us. I do know of teachers who will simply put on a videotape, let it run for an hour, and then walk out of the classroom, and that's it. I don't think that is good use of television, we should use the television as our subject, and use it under it under our control.

I certainly agree with your general criticisms that we must look at all our media. All of them have shortcomings and all of them have advantages — but we must remain in control.

Chairman: Professor Kida, please.

H. Kida: My name is Kida from Dokkyo University

I was very much impressed by the series of presentations this afternoon. In the interest of time, I would like to confine myself to one major point based on what Professor Henningham has mentioned. And I would like to invite his comment.

I think it was the time when I was a university student that I was reading the German Philosopher Nietzsche's writing: Reading a book is not studying. Therefore, one should not deceive one's self by reading books. It is only a stick of match. The stick of match cannot create fire, but only give the illusion that it can set a fire.

So, there are the merits and demerits of TV. The demerit aspect is very similar to what Nietzsche mentioned about reading books. Of course, TV and the printed media are different, but in the essence of learning or education, they may be very similar.

Of my comments, I would like to invite your observation. Also, a few years ago, there was a very interesting occurrence that took place here. Immediately before the opening of the University of the Air, we had a symposium discussing what sort of lectures would be best suited as lectures for the University of the Air. Citing actual examples of various programs, we solicited the views of the participants. Very unfortunately for all the University professors, the result was that when the program was a professor just giving a straight talk, it was most uninteresting. However the documentary programmes produced by a TV director was found to be most interesting. All the professors were taken aback by the results.

Children or students nowadays have been fostered and reared up to think that way through TV. In other words, the ambient of TV is more predominant, and they are more prone to respond to the TV or the documentary programme while the straightforward format of giving lecture would simply put them into sheer boredom. That symposium clearly put forth that result by asking those questions.

Now, I think it's a very difficult question. You mentioned, that rather than controlling the TV. How should we best lead and guide those youngsters being controlled by TV? This, I think, is the crux of the issue for the broadcasting education.

J. Henningham: Fine, fine. As far as the printed word is concerned, and Nietzsche's comment, that also reflects the fact that when printing was first invented, there was a controlled exercise upon them almost from the beginning by the authorities. Because printing was seen as a great threat to the established systems; —to the rulers. Of course, we know that even today, in authoritarian countries, there are severe limitations on ownership of printing presses, photocopying machines, and so on. They are still very rare in countries like the Soviet Union. The printed medium, any means of

distributing information in large quantities, can be dangerous to authorities in an authoritarian state.

In terms of television and students, I thought that you were reflecting the same sorts of concerns that are now coming through the literature about children's relationship with television and how this develops within them as they grow.

I think one point that's interesting is that universities continue to use the traditional methods of lectures, although there is evidence that it's seen as more boring by students, and they would rather watch television yet, they continue to use these methods. Is this because universities are innately conservative and because teachers are innately stupid and unprepared to listen to the evidence?

Well, perhaps to some extent. But I would like to think that the traditional method of giving lectures will continue, and that we won't give our education system over entirely to open universities with students doing all their studying at home, in front of a television set. There will continue to be a great deal of contacts in the traditional way between teachers and their pupils.

Chairman: Yes, please. Mr. Saito.

O. Saito: I have a question for the Professor from Thailand.

In the developing countries, especially in a country like yours, how is distance education introduced? What is the status of that kind of education in the higher education level? What is the percentage of those people who attend courses of distance education among the same age group people of the total population?

J. Nimpanich: In case of the number of the percentage of who attend course of STOU. Firstly I waited to compare with the conventional system.

At the conventional universities, the number of the students is smaller than the STOU's university. As I presented this afternoon, I told you that the number of my students is more than half a million, while the conventional university such as Chularonkorn University has the students of about 10,000. So, the numbers of our students are more than the conventional universities. Secondly, the age kof STOU's student is about 30—40 by average.

O. Saito: Thank you very much. But what is the quantitative weight that it has? Hundred thousand versus five-hundred thousand? In the higher education level, what is the weight that distance education plays in higher education in your country? Qualitatively.

J. Nimpanich: The quality of the students?

O. Saito: Yes, that is fine.

Nimpanich: The result of the recent research showed us that the quality of STOU students, when compared to the conventional universities, is the same. There are many indicators to show this. One of them is the number of our students being able to enter the graduate school like other students from conventional universities. This is one of the indicators to other the quality of our students.

Chairman: Thank you very much.

Chairman: Maybe, perhaps, one last question from the audience. Yes.

O. Takenouchi: Takenouchi from Osaka University of Foreign Studies.

There has been discussions some very interesting concerning the use of television for providing lectures. TV vis-a-vis printed media was the subject of discussion. And I think it is an important subject.

One of the discussions was that underlying all this, there is an element of entertainment in the use of television. And I agree with that line of thought very much. When you think about pure study, you have to read a printed medium through your own eyes. And I think there is a basic need for the students to use his own eyes to read printed medium. It's not that television programmes are good or bad, but the important thing is that there is a good, solid text; so that by reading a text repeatedly, one really is able to learn.

Of course, TV has a video medium and video can be watched many times -- repeatedly. Consequently, the same thing could be attained. However, I think it comes back to the need of reading books. If you try to search only the places you want to watch on video, it takes time. With books, you can read sections of a book that you really like to study many, many times.

Mr. Kikukawa said that he now thinks that he really hated education; and not learning. When I watch television programmes these days, and I will say that I am a mathematician, that I have never liked things that were literal in nature. I never liked Japanese language studies. Yet on television, there are very interesting programmes teaching the Japanese language. There is an entertainment element in some of the programmes that attracts my attention.

I think the important point about television programmes is that they can be attention catching. In terms of the distance education, I think that's the important

point to remember. In the final analysis, may I invite Dr. Harry for your comment on this point?

Chairman: Do you have any comments?

K. Harry: Certainly, yes.

I don't think it necessarily has to be a case of TV versus print. It is possible for television to carry the teaching message, of course; as -- the principled teaching method in a distance teaching institution. But it is also possible that TV may be used as a supplementary medium. And I was just jotting down a couple of ways in which television might be used. For example, it may be used in mathematics, to demonstrate the use of graphics, which may not be possible for a printed text. It may be possible to take students through television into a scientific establishment, to which they would not normally be admitted. Or, again, it may be possible to demonstrate an experiment through which a student may kill him or herself at home.

So, I don't think it has to be a case necessarily of TV versus print. There is room in an integrated system, for the use of the two.

Chairman: I think time is running out on us. So, with this, we would like to bring this session to a close. We shall be having a Reception afterwards, and we have another day of discussion tomorrow. So, there are many opportunities for face to face discussion.

There is one oversight on my part. I should have introduced myself at the outset. And so, before concluding, let me introduce myself.

My name is Kato, the Director of National Institute of Multimedia Education. Professor Fukui, the Head of Research and Development Department of our Institute, has been in charge of overall organization. Professor Fukui also did not introduce himself either. So, there are lots of oversights on our part.

Professor Fukui.

Y. Fukui: Well, please excuse me for not introducing myself. But we shall have Reception at 4:30 in Wakaba Reception Hall of the University of the Air. Please follow an arrow, or a sign, that is at the other end of this complex.

We will start our Session thirty minutes earlier, at 10:00. The registration starts at 9:30.

So, with this, we have successfully concluded the first day of our discussion. Thank you.

Secretariat: Some household announcement.

You can walk outside to the Reception Hall, but because it is raining outside, please go through the hall and corridor of the building complex. There are signs leading you to the Reception Hall. So, please follow those signs. At the Reception Desk of the Wakaba Reception Hall, you can check your belongings.

Thank you.

Session II

Application of New Media and its Relationship to Guidance in Schooling

Chairman: Takashi Sakamoto

Professor, Tokyo Institute of Technology, Japan

Chairman: Good morning, Ladies and Gentlemen. We would like to start the second day of this International Symposium on Distance Education. My name is Sakamoto, from the Tokyo Institute of Technology. I shall be serving as your moderator. We will have presentations by five specialists this morning.

The topic of this Session II is the "Application of New Media and its Relationship to Guidance in Schooling." It says guidance, but I would add Guidance and Teaching in Schooling. Recently, with the rapid development of the means of communication, it has become possible to transmit a large volume of information at low cost. Using the visionary image, the interactive communication on transmission has also become possible using satellite and other means. Therefore, there has been remarkable progress in terms of media of communication as well.

The interactive exchange of information over great distances has become possible. In the past, using telephone, postal services or broadcasting we tried to establish distance education in either "one way" or "interactive way," but new developments in technology and media have exerted a major impact on distance education. We can clearly say that new media is changing distance education. So here we shall be learning the actual examples of application of such new media to distant education and looking to future directions.

The first presentation is by Dr. Kobayashi, who served as the Vice President of the University of Air until quite recently. Professor Kobayashi graduated from the Tokyo University of Commerce and is a Doctor of Business Administration. He also taught in the Tokyo Institute of Technology and worked as a Dean of Education Administration or the Dean of Department of Engineering, the major pillar in the university. He has been carrying out various experimental works to actually use new media.

Dr. Kobayashi, please.

Y. Kobayashi: Thank you very much, Mr. Chairman, for your introduction. Good morning, Ladies and Gentlemen.

This morning, I would like to talk about our experiences when I acted as Vice President of University of the Air for a period of six years during which time we made a lot of new attempts and new ventures. Mr. Sakamoto has referred to the theme of the discussion.

President Koda said yesterday something about our university, how it functions and the constantly various problems that have to be tackled.

First of all, I would like to tell you that the written text of my presentation is an outline of what I am going to tell you and I would be very glad if you would refer to that text at a later stage. Because of lack of time, I will not necessarily touch upon this text but will speak freely.

Since the start of our University of the Air, one major problem that has been faced concerns is actual attendance by students at various classrooms. They have to physically attend classes. There is a law which was introduced by the Ministry of Education governing university education by correspondence. The University Correspondence Course Standards is the regulation which says that by the time a student graduates from a university by correspondence, at least 30 units or credits have to be obtained by the students through their actual classroom attendance. The total number of credits required is more than 124 credits for ordinary university students and out of those, 30 have to be obtained through schooling.

In our University, all the courses are given through TV programs or radio programs on the air. Everything is instructed on the air, so we wish we could be given a more lenient regulation. What is required for the students is to obtain 20 credits, given the fact that all the programs are offered through TV and radios. We wish the number of credits could be even less.

We have eight study centers and at these centers professors do actually give classes. We have approximately seventy subjects. The number of subjects offered differs from one center to another, and Monday is a holiday. So except for Mondays, the centers are open every day until 8:30 in the evening. One course has 1.5 hours multiplied by 5 times and students who attend that specific course are given one credit.

When we welcome non-Japanese guests to our university and try to explain how we function, very often they seem somewhat surprised to learn that although the students are enrolled in the University of the Air, they actually have to attend classroom classes. Their surprise is well founded. (I can well imagine their surprise.) Housewives and business people who work during the day are students of our university. They want to learn in addition to their respective work as housewives or company employees. To ask them to come to study centers to attend classes is demanding too much from them.

However, this situation may have something to do with the Japanese specific

situation which in turn deals with the University Correspondence Course Standards. Another aspect that is specific to the Japanese students is the fact that among our students, there are some who are attending or taking courses at a higher education level for the first time after having reached a certain age. Certainly they can read printed materials themselves and they can also listen to radio programs or watch TV programs. However, depending on the type of course, or on the way in which a professor gives his lesson or speaks to the students, the reaction on the part of the students may differ. Still the attendance for any program or course is somewhat unidirectional instead of conversational. That is why, in a way, it is a good idea for the students to attend classes, because they can have more stimulus. They can ask questions personally to the professor and can receive guidance and personalized teaching at classrooms.

The students do appreciate that aspect. Tutoring systems have been introduced in various open universities like the Open University in the U.K. I do know that in the U.K., they have a lot of tutors who give guidance and teaching personalized to respective students. Of course, it would be very nice if the Japanese system could integrate that system into the open university. However, somehow the Japanese system does not seem to be very compatible with that tutoring system. Even without this type of tutoring system, by students attending classroom classes, they do receive similar guidance. Sixty to seventy subjects are taught at 8 study centers. Study centers are located only in the Tokyo Metropolitan area and its vicinity and this area was considered as the Phase 1 project. Before expanding the subject area to the whole of the nation, it will be necessary for the university authorities to have a sufficient number of professors, 400 to 500 in number, who can support us.

In addition to full-time professors we do ask for the help of 400 to 500 outside professors. Since the conversational method of teaching is of great importance, that reminded us of the possibility to use new media. Today, with 80% of the budget allocated for the University of the Air coming from the public fund, from government funding is very limited. So approximately 80% of the money comes from the government and full-fledged conference in television conference systems, which is experienced at the Tokyo Institute of Technology connecting two campuses, is very hopeful, but not so easy to introduce.

I think the Californian example will be referred to at a later stage by one of our guests as well as NEC's inhouse education using new media television conference which is another example of how such new media has assisted education. In our case, the University of the Air has certain budgetary constraints so that we have to make the best with what is available as far as resources are concerned. Several years ago, we embarked on a pilot television conference project, the ultimate goal of which was to

incorporate television conferences into our education in the future. I would like to share with you what we have been doing in the area of classroom instruction or schooling at the University of the Air. A major part of classroom instruction is schooling. We have the National Institute of Multimedia Education, (N.I.M.E.), which has a lot of projects and our university has cooperated with this institute. Sometimes initiatives come from our university, sometimes the initiatives are introduced by N.I.M.E. We respond to that initiative and both of us cooperate with each other for the introduction of new systems of instruction.

Computer-aided instruction was one idea which was introduced several years ago by N.I.M.E. This institute tested the instruction system with the help of a company, Epson (former Seiko) computers were borrowed and using these computer on lease from that company, education was conducted. There was certain concern or doubt in regard to the effectiveness of having such a project in a big Metropolitan area, but at any rate, such a project was made.

Secondly, prior to full-fledged studies and experiments, we did have several preliminary experiments. The first experimental project was conducted with the cooperation of the Prefecture of Kumamoto in the southern-north island of Kyushu. A telephone conference technique was introduced in this project.

I will just briefly explain this system. This (picture) is the system used towards the end of the project. Here (Map of Japan) you have this University of the Air...sorry, N.I.M.E., and this is Kumamoto City, Hitoyoshi City and Hondo City and another city, four places were linked with N.I.M.E. This (picture) is the teleconference. However, we did also look at the other side, visually still picture, and certainly telephone cable, facsimile and electronic blackboard was used.

You will find that picture on the other side of the rostrum. I myself acted as a professor giving lecture. It was a lecture on "Business Management" given to students in Kumamoto. This was the first class offered by me using this system. In the next picture, the man who is standing is an associate professor and English native speaker, an American person and the lady who is seated is the associate professor of the University of the Air. This is the English class, so we did use this system for English courses.

Another picture. This shows the classroom at the receiving side. I do not know in what city, probably in Kumamoto city. These are the persons who are receiving instruction, trying to respond to questions asked by the professor. This happens very often in the case of English class. However, when it comes to classes like English, teachers have to correct pronunciation, English pronunciation, etc., so this type of system, teleconference, is not very practical. Maybe as a question of habit, however, it has to be improved.

In 1987, N.I.M.E. started using a system, INVITE 64 system developing by KDD

(International Telephone Communication Company).(tab)I am afraid this (OHP) is written in Japanese but this shows the system. The main characteristics of this system is the following. A digital network system which started to be available for commercial use was used and 64 kilo bit per second and still pictures as well as moving pictures could be obtained. The capacity was 64 kbps, which is not large, which means that the moving picture had a very slow speed. In addition we certainly could use still pictures, facsimile and the electronic blackboard, etc. This picture shows only two places, but several different locations can be connected through this system. INVITE 64 system was used several times within N.I.M.E. and at the same time, we conducted a series of studies at the Chiba Study Center. Because of lack of time I will proceed to the third example.

The third example started in December 1988 linking Saitama Study Center and Tokyo Study Center II, both of which are located 25 kilometers away from each other, the students and professors who participated in this project were monitored. This (OHP) is the result of this experiment. Here you have the picture on your lefthand side. This is the host side, Saitama Study Center. The Tokyo Study Center II is the receiving side. This (OHP) is the result.

Let's first look at the reaction on the part of the students in response to this experiment. Subjects involved were "Japanese Literature", and an associate professor of our university participated in this project. This course is basically a course in which the professor gives lectures to students. However, printed materials are used and professors do ask questions to students.

Another subject is "Earth Science". Professor Nasu who spoke yesterday has involved. In this subject a lot of visual support was given and the reaction was given from students and professors. Three is average or normal, if 5 is given it's relatively good. One is bad. For example, image is normal, sound is good, recognition is easy. Sometimes students said that the movement was too slow and there was fatigue to a certain extent because of that system. Otherwise, they feel familiar with the system; they feel normal: they did not feel isolated. So the reaction from the students was relatively good for both subjects.

All of our students are used to receiving instruction and education through TV programs and media programs, so they were somewhat disturbed by the slow speed of a movie. And the video image to them was too slow. The size of classroom was a problem because of the hardware and equipment, not the whole of the class could be pictured, so only a portion of the classroom was viewed by the students by the other side. What about the cost? For this specific project, we had to pay money for using the equipment on lease from the manufacturers. For the previous project, we did not have to pay anything, because we had a contract. Since the contract expired, however, we

had to pay some money for the system's usage, approximately 3 million yen was paid.

This project lasted only one week, and if we were to use this system for a longer period of time, the cost would be lower. Two or three study centers can be connected and one single lecture can be transmitted to 2 or 3 different study centers that is one big merit. In the future, a television conference system, if we could afford it would be the ultimate goal as far as our university is concerned.

In regard to future prospects I would like to share with you something. Broadcast satellite communication is another system that we would like to incorporate, but it will incur a lot of money. So to start with, we would like to expand our Study Centers throughout the nation and thanks to support from various organizations. Already we have a tentative project in Hiroshima. However, there is still pending issues of schooling and necessity to bring about conversational two-way instruction. Television conferences can complement this. As far as guidance is concerned, professors, especially the full-time professors who give guidance to students, once they get used to this kind of new media and equipment, it will help them a great deal to be able to communicate with the students.

I think the time has come for me to conclude. Thank you very much for your attention.

Chairman: Thank you very much, Professor Kobayashi. Three projects have been introduced to us. You may have questions regarding his presentation but we will entertain them at the later date. So we will proceed to our second speaker, Prof. E. Marie Oberle. Professor Oberle is the Director of National University Teleconference Network of the United States. Professor Oberle will be explaining to us the NUTN, Professor Oberle received a Doctor's degree in Oklahoma State University in pedagogy, nursing and life-long education, and is very active in various associations. Professor Oberle, please.

E.M. Oberle: Thank you, Mr. Chairman. Good morning. I would like first to express my appreciation to the University of the Air and the Institute for Multimedia Education for the privilege of being the part of this distinguished group discussing a subject that is very dear to my heart. In the time that I have with you today, I will highlight and explain on my paper, the National University Teleconference Network, a new force in higher education. Actually, the communication satellite is the new force and the consortium of universities is pioneering the applications of that new technology.

Through the use of transparencies and a short video tape, I will briefly touch on the nature of the consortium, why there was a need for such an organization, present

some applications and speak briefly to the prospects of the future. My challenge, of course, in a short time is to give you enough details so that you will not only understand what we are doing, but be able to still convey the broad picture that I feel there is a great potential for this satellite medium.

But first, I'd like to help you get a sense of where this coordination is taking place. This is a map, of the coast of the United States, and the shaded area is Oklahoma, many of you may know us best by the western movies with the cowboys and Indians. This is a small community in a university town of approximately 45,000 and half of those are university students. Oklahoma State University in Stillwater, Oklahoma where you see the dot is the host institution for the National University Teleconference Network. I will be referring to the term Teleconference to mean a conference at a distance using the electronic media. This conveys satellite teleconferencing, audio-conferencing and computer conferencing. And I will identify these in the text of my presentation. In addition I will be using the terms consortium and network simultaneously and refer to the National University Teleconference Network by its acronym. I don't know if you are accustomed to use acronyms to shorten these long names but its NUTN and we call it Nutn.

I will be speaking more specifically about the consortium that I represent but I will mention other activities to provide a sense of the use of communications satellite in the U.S.A.

What is NUTN? I apologize that I don't have these also in Japanese. It is a consortium. Of institutions of higher education and the mission is to provide effective electronic means of exchanging information, primarily through the use of the satellite. This organization is in its 8th year and is pioneering the use of satellites in higher education in the U.S.A. This is an extremely diverse membership including research universities, land-grant colleges, 2-year technical colleges both private and public. These are located throughout the United States, Canada and Mexico. All of these areas can be covered by a single satellite; the footprint covers that much area. We have approximately 3200 institutions of this kind, accredited institutions of higher in the U.S.A. Dr. Meuter will soon be speaking about Chico State University and they are member of this consortium. Nest transparency, please.

Why was this organization needed? We perceived that it was needed. First, the educational community was strained for resources, financial and human. Grants were very difficult to come by. We have a shortage of qualified professors in specialized areas. And second, the traditional enrollments were declining. The last of the baby-boomers were nearly educated. I understand this is occurring in Japan as well. Third, the information explosion was upon us. Dr. Morrison reminded us yesterday that information was and still is multiplying at such an amazing pace. We are all struggling

to keep up with it.

Retraining and professional continuing education is a must to keep current. So that the non-tranditional student was eyed with great interest by our institutions. The average adult in the United States makes five career changes in a life time so there is really a challenge to us to try to keep these professionals updated.

And fourth, there was a profound change in the way we communicate as a society. The communication satellite was a technology that needed an application and we believed the satellite provided us with the opportunity to reduce our geographic barriers. There are many of our states that do not have a capability of receiving television. However, they can utilize a satellite receiving dish and be in touch that way. This way we could reach thousands of people with what we think are the latest thoughts from the greatest minds from all of our wonderful universities. So given this environment, a group of visionary educators were looking to alternative ways to serve their constituency and this is how this organization came into being.

The organization took the nature of a consortium that would function both as a professional association of higher education teleconferences and a satellite delivery system for programs. The membership would bind the group and the members would be represented by the advisory board. This arrangement would allow member institutions to utilize audio, satellite and video to reach national and international audiences with programs that they originate.

So how does this work? First, a member institution must come up with an idea for a program that is really compelling. It must be timely and it must convey the most current information. It cannot be local in nature. For it will not have a wide appeal. Second, it must develop a quality program, that means using the experts in identified subject areas. And third, its marketed to a target audience. Through colleges and universities. To be able to participate a receive side would need to have a satellite receive dish and a capability of pulling that signal from the satellite. Because these programs are all offered live, interactive, satellite video. That's one-way video, two-way audio.

And then, fourth, the coordination is really the secret in giving a successful experience. We work with a key person at a college or university and these persons are generally in continuing education so that they are accustomed to doing conferences in institutes. The coordinating office which I represent is responsible for all of the training, all of the consulting and coordination that needs to take place as these national programs are put together.

Let me just speak briefly of a program example that might give you an idea of how this works. One institution came up with the idea that business industry is really in need of more information on the economic integration of Europe in 1992. So this

university worked with our U.S. Department of Commerce. They were able then to put together a quality program using the experts. It would be so expensive to bring all of these experts to one institution to receive this information. So, we sent a camera crew to the Economic European Community in Belgium and taped the ambassadors. Then the second level in command were actually the persons that participated live on the satellite video teleconference. The target audience was business and industry, although trade associations as well as colleges and universities received it for curriculum enrichment. Many of these are very timely societal issue kinds of programs used by our universities for curriculum enrichment. The coordination was then done by our network. We needed to find the site that could receive the program and the people that wanted to see the program and put them together. Of our 3200 colleges and universities, approximately 1500 have that capability to receive the satellite signal. We have about 50 business networks that had been established and using our technology. In addition, many high schools have the receive capability as well as government offices and libraries and other public buildings.

I would like now to show you a short video tape of a variety of programs that we do. May we have the tape, please.

(Showing of video film)

Our programs are from two to four hours in length and they are all live, interactive. Of course they have a number of tape segments to provide emphasis and variety in the programs. In an effort to put what we call "the high touch to the high-tech" we recommend a local component to every program. We call it "the local wraparound," where the receive sides bring in technical experts that speak to the national program in light of what it means for their own community. This way we feel that we have more active learning taking place than we would have just watching the television program. In addition, we have a variety of instructional designs for the programs so that we even design activities where there can be a small group discussion. We are being very creative in ways of doing this teleconference because we think there is more active learning taking place. This is what we are working toward.

Obviously, to make this delivery system cost-effective we need large numbers; we need to distribute large numbers. But then our challenge is how do we interact? So we are using a number of ways with the computer with the facts and, of course, we are always with the audio component.

The coordinating office works with other educational institutions, special groups, member institutions, the government, other networks, many, many networks are bring established in the U.S.A. Many of you heard of the National Technological Network. We work with them because once you have a networking place everyone wants to take advantage of additional programming and use that equipment. So we help to

coordinate all of the networks. The services that we provide are broad, the main one being training. We provide a training by plant, by audio conferencing, by computer conferencing, by satellite conferencing and face to face. I will be leaving here this afternoon for such a conference in California with the members. Our program can be diverse from continuing education for business and industry to a very wide variety of programs.

I will just say that in terms of what works you will be able to read in the paper more specifically what we have found that works and some of the things that did not work. We obviously made some mistakes. But the most important thing and I think you will appreciate this being in higher education is that we did allow for the local autonomy of each institution to be protected, and I think that we one of the key successes. As I said, you may read about these more in detail in the paper.

The environment in which we were operating had some very key factors that benefited us as we developed this network. Many of our institutions had a fear of being left behind if they did not participate because the colleges and universities know that they have to develop a strategy for the 21st century. We have a desire, I believe, for equality in our society and the educators are searching ways to reach minorities, disadvantaged students, and those living in remote and isolated communities. Telecommunications can be the great equalizer.

Then the third factor was that there is a conversion between the interest of higher education and the interest of business and industry. Increasingly, businesses are looking to colleges and universities to provide training and retraining that they need. And, of course, colleges and universities have the expertise that business and industry need.

There were obviously many obstacles to the development, and the most important one was that there was no precedent to follow. We faced skepticism on a daily basis still do. We were ahead of our time as we were pioneering this new application. We could not guarantee it would work and it was a threat to the traditional way of teaching. You may read more about this in the paper.

I would like to speak finally to the prospects for the future. It has been an accessible experiment in cooperation and clearly the University of the Air and the Institute of Multimedia Education know how powerful you can be if you cooperate. And this is what its all about, I believe, in this new communications industry. The communications technology is a new force in higher education. There isn't any question. NUTN is privileged to be a part of that force. We have educated a whole generation of teleconference users. And in all honesty, I must add that we have made some mistakes. However we are doing some things right if we've been able to stay together for eight years. Many believe that satellite teleconferencing is a fad and that it

will go away. I think they even hope that it will but it hasn't. Currently, I am sensing an acknowledgment by our institutions of higher education that teleconferencing is here to stay and they are saying "teach us, we want to learn." We know that we are going to have to get into using this technology so that our training for our institutions is really just beginning.

I'd like to share with you that we envision a global network. We are already integrating the technologies. We want to do that more so that our efforts will be more effective. We see many networks being established. Your research universities will have their network. There will be an international division; the junior college is developing a network. The four-year colleges have their network. All of these can serve their institutions individually and then we can all cooperate when we want to have very wide distribution of programs.

High schools, business and industry, government and so forth are served by the institutions of higher education in our design. Internationally, we will be doing our first international teleconference in August 1990. And it will be on applied biotechnology. It will be research oriented. And it will be uplinked from Cologne, Germany and from Washington State University.

There are global networks being established. NUTN is a secretariat of one called Foundation for International Tele-education. We have a number of persons here in Japan that are part of it. I send information to the President of the University of Tokyo and there is another person that I send information to regularly on this global network. So this is a start. It is a start of what I think will benefit all of us in our global society.

I appreciate very much the opportunity to be with you today and would welcome the opportunity to answer any questions. A number of your professors from the Institute of Multimedia Education have visited with us in Stillwater and I invite more of you to do the same.

Chairman: Thank you very much, Dr. Oberle. You have contributed to us a very valuable experience that you have undergone in the last 8 years of your program. Next is Professor Yasutaka Shimizu of the Tokyo Institute of Technology. His field of expertise is electricity. He is also very much an authority on educational Technology. He will be talking about the experimental teaching system utilizing optical fibers. He was instrumental in designing a national operation of this system for the university.

Y. Shimizu: Thank you very much. Shimizu is my name from the Tokyo Institute of Technology. You have just heard from our moderator about the optical fiber communication system that we have within the university. Today, we will be talking about the system that we started in 1981 and 1982. We have been using this system

continuously in our university education and I would like to briefly speak about how we evaluate this system. Also, we have been recently cooperating with the use of a more advanced system HDTV, that I'll be talking about. In January of this year, for only a short period of 1 month with the cooperation of NHK and NTT and other manufacturing companies, we have been able to use high definition television in our classrooms, we evaluated the result of our experiment and we made comparisons between HDTV and the traditional NTSC system. I would like to share with you the results of our study.

First of all, we have used the optical fiber connection in education; we also utilized radio waves and satellite communication and regular telephone lines as well. We use the optical fiber especially distance for our education purposes with the use of optical fiber in distance education, various things are possible. There are many modes or forms of distance education. It can be, for instance, an audio lecture which relies on the sound transmission. Many attempts have been made to do this. Trials have been made, but since students have to rely only on hearing, they have to concentrate very much on their hearing ability and thus get very tired easily.

Another alternative is the electronic blackboard system which can send handwritten letters or drawings on the blackboard, the information can be brought on the system.

Then we also have a stationary video picture system which was discussed earlier. We can have a semi-stationary video picture system, INVITE 64 that the other gentleman talked about. Then we have a moving picture system, with which we can send moving pictures. Another alternative is high definition telelecture which uses high definition television. We conducted experiments on this for one month this January.

So these are the possible alternatives what are the pieces of information that can be sent? Audio, electronic blackboard system, stationary, semi-stationary and moving video pictures are methods by which various pieces of information or be handwritten pictures and drawings can be sent. An OHP or slide can be sent on 4 out of these 6 alternatives.

You have heard already the examples of NUTN and the systems of Mr. Kobayashi. There are many ways of submitting these pieces of information. Broadcasting is one point to submit information to a multiple number of receiving ends, and unilateral is the case of broadcasting and in the case of telecommunications network, the bi-directional, two-directional communication can be achieved so that conversation or interectual communication can take place.

So there are one-way communication, and two-directional communication. Semi-two-directional communication is also possible, which means that it uses one-way video and two-way audio. So image picture can be sent one way but since there are two

channels for audio, students can send their questions to the teacher or instructor. In our case, what we have is fully bi-directional system two ways for video and two ways for the sound. This was done in order for the system to be able to approach a live classroom atmosphere and this map shows what our project add in terms of its coverage. We are across the Tokyo Bay in Chiba but the system connected our Ohokayama campus in Tokyo with our Yokohama campus, 27 km in distance. Luckily, between these two campuses there was a private railway line connected to the campuses. Therefore, we used their track to connect a single mode optical fiber between Ohokayama and Nagatsuda campuses and through this means we were thus able to create a live educational environment. The distance for the fiber was 26.4 km and we used 1.3 radio wave and 400 mega bits per second was the speed of information transmission. There were eight fibers used in the optical fiber so a large amount of information was able to be sent.

Today, we are using 32 mega bits per second to send one image. A very high definition, high quality picture is being sent and since we are using a high speed of 400 MBS, it can accommodate easily the HDTV pictures as we demonstrated in our experiment conducted in January.

As I said, we borrowed the track side of the railway company and these are the pictures showing how we are laying the tract for connecting the cables. This orange cable is our university line and this is on campus. It shows how the cable is laid within the campus and the number of channels for TV that can be very large using this system. Presently, we use a TV lecture system. Next to the blackboard we have the 70 inch video projector. This one you have right behind you is a very large monitor system but we have just as large a monitor screen, 70 inches, about 3 meters across. So the images of the teacher or the blackboard can be shown life-size. We will be showing some of the pictures. This is the case in which an OHP is used. This is the wall picture of the instructor using the OHP and through this, the distance education system when the image appears on the large screen. The bottom picture is how it appears.

We evaluated the results of our project and I have on many occasions in the past reported the results of our project. We have questioned our students to see how they evaluated our program. We conducted this survey at the beginning of the term and also half a year later, after about 15 lectures. The same questions were asked after an interval of about 6 months and when students are exposed to this system for the first time, they tended to give high evaluation. After the 6 months, however, when they were used to the system, they began to complain. For instance, the letters they said, were not very legible.

This is because when you see a real-size picture of a teacher and you see the blackboard, teachers are very eager to concentrate their mind to even read the very

small pictures they may or may not be able to see on the screen. Half a year later they became objective and began to sometimes complain. These factors of evaluation how easy it was to see the picture, how was the atmosphere conveyed and how was the quality of sound, how was the position of the screen, these were the factors on which questions were asked.

The first factor was the ways of viewing; the second was the live atmosphere, whether the live atmosphere was conveyed or not; the third factor was the quality of the sound; and the fourth factor was the position of the screen, No. 3 indicates a medium evaluation, No. 1 is a poor evaluation and 5 is the top rating. On the average you can see as in the green line when they are exposed to the system, in the beginning of the term they tended to give higher evaluation. But toward the end of the term, as shown by the blue line, the evaluation tended to get lower. And there was a significant difference by more than 1 percentage point. In terms of the atmosphere, sound and the screen the evaluation points were the same without any statistically significant difference. In terms of ease of viewing, whether the screen or images were easy to see or not, there was a distinct difference in terms of the students' evaluation between the first time they saw the image and 6 months later.

We have what is called the Hawthorn effect, when somebody is evaluating a new system, they are taken aback; they are surprised. Therefore, the evaluation tends to jump up. Gradually as they get used to the new system, the evaluation comes back to the original level, sometimes even below the original level of evaluation. If the blue line the final evaluation rating, is higher than the original level, obviously the system is to be welcomed. If the red line is high then the final evaluation is below the original level. Obviously this means that the system is not a welcomed system.

This is what is called a Hawthorn effect. This is a concept used in business engineering. The report is from Mr. Kobayashi. So with regard to the quality of picture, the red line was unfortunately the case but with regard to the other three factors, there were no significant differences. So the blue line was the case.

We came to the conclusion the only thing needed in terms of improvement was to make better the quality of the picture and the original system we used was two screens of 70 inches. With high vision, the HDTV is wider like a cinema pictures. Therefore, we were able to use only one screen so the overall size of the screen was smaller than the previous screens we had been using. We are showing a video not having any sound because I had to edit the video last night in a rush. It was taken by a student, an amateur cameraman and the picture that was taken by the amateur was edited by myself, also an amateur. So it is not going to be a good picture. Nevertheless I will show you the video. I will be putting in the narration.

(Showing of video film)

The equipment used is very heavy for HDTV but with the cooperation of the manufacturers we were able to bring the equipment onto the campus. The one you saw was a light one, but the overall system was very large, which required adjusting the system, using one classroom and controlling the system and the camera used for the HDTV. I understand it cost about ¥60 million. The cameraman dropped it during our experiments, and we had to make adjustments on the equipment. Since we were using optical fiber we had enough transmission capacity. This is the monitor and camera control unit. Many electric manufacturers cooperated with us in this project. This is the scene of the lecture. A very clear picture can be received through HDTV but since this video was taken by an ordinary video, you dont see the quality of the picture. But this lecturer is talking about electric circuits and since lighting was not perfect, you see the reflection. Actually, you got an impression that the lighting was not that bad in the classroom, because in this video the poor lighting did not come out very well.

This is the classroom students taking the class and Dr. Sakamoto who is our moderator also appeared in our lecture. The students, as you can see, are very serious when it comes Dr. Sakamoto's lecture. And there are some more we could show but for now we will conclude the video program.

So, this is how we used HDTV, as I said, many companies were involved in this project; we connected two campuses Ohokayama and Nagatsuda; and two methods of transmission were used because we were experimenting with them. From Nagatsuda to Ohokayama, from left to right, we are using analog system, FM multi-optical transmission technology developed by NHK. For the return direction, we used a digital system developed by NTT. Both these were used during the Seoul Olympic games and we were able to make sue of these very advanced system free of charge because of these supporters, NHK and NTT. And this is how the lectures or classroom activity was conducted and how people evaluated our experiment.

The Letters may be too small for you, but we asked the same questions of the respondents, the same questions we asked when we were carrying out the previous experiment without using HDTV. So that we could make a comparison between the NTSC system, a traditional TV and HDRV, clear differences were seen particularly with regard to the quality of picture. People evaluated HDTV much more highly, which was naturally to be expected. We conducted fact analysis as, and there were three factors for the HDRV experiment. When the NTSC system was used, the quality of the image was the biggest factor. With the HDTV, the most important factor turned out to be the atmosphere of picture because people evaluated the fact that a live sort of atmosphere was conveyed through the system. The second factor was the quality of image, the third, sound and screen.

I will show you another OHP in the case of NTSC, the sound of screen was two

different factors but with HDTV we combined them into one. In any case, the HDTV showed much higher evaluation results.

One natural conclusion was the more money you spend, the better system you end up with. The students were divided into undergraduated and graduate students so as to compare these two groups on three factors, atmosphere, quality and sound/screen. As you can see, graduate students tended to give higher evaluation compared to undergraduates. And taking the average of these three factors, since the average point would be 3, you can say that undergraduates also gave high marks but in comparison to graduates students, undergraduates evaluation was lower.

The rationale behind this is that maybe the graduate students are the select students who come up from the undergraduate level. They are more eager to give high marks to these systems because they are willing to study. We also invited representatives of the companies which took part in this project to actually experience the new system and we asked these businessmen the same set of questions. This is the result of the questionnaire. Since businessmen are not used to classroom atmosphere, they give very high marks. However, since they are also expert in this kind of system, when it comes to the quality of image, the businessmens evaluation was lower than the ordinary students. For sound and screen, the evaluation marks were about the same.

This is the result of our distant education using the high vision HDTV system. Originally, we have been doing this kind of experiment since 1981. This system was developed by a committee of which Mr. Kobayashi is the head and on a continual basis, we have been keeping evaluations. For the system like ours which is both video and sound in two directions, one point that has to be evaluated is the sound environment. There is a difficulty involved in terms of what is the most audio effect that can be created. The visual environment is easier because TV means that as long as you send a picture, the viewer can see the picture. Sound is different. Depending on the room, there are other audio effects and particularly because we are using two directional systems, the sound system turned out to be the most difficult to control.

System function and cost effectiveness are two of the factors that also have to be attended about. Also, what about the running effect? We looked at four factors. The sense of participation or sense of satisfaction was one factor how people evaluate it —the level of satisfaction they were able to feel when they were participating in this program. Since this was distance education, however, the content of the education or teaching substance was also important.

The second factor to grade the running effect was to what extent students actually obtained or learned knowledge or skill? This could be checked through both a pretest and post-test, before and after the test. since we are using this system only for the graduate level, we felt that there could be a difference depending to whom we were

targeting the program. Undergraduates level of eagerness to study will be different compared to graduate level, who is a more selected group of students.

The third, important point is how the student was able to apply what he had learned in terms of knowledge or skill, the second factor. In the case of a company, the fourth point would be what has the businessmen learned, which would be reflected in his actual business performance.

We so far have been looking at the first factor, the level of satisfaction. The other three factors, however, have to be also studied. The factors that affect the evaluation, affecting both teachers at the top and students at the bottom, because of actual presence of teacher students might be affected with his willingness to study. Our experiment at least resulted in students feeling the sense of unity or a sense of togetherness. Since we used four altogether channels for this system both TV and sound fully bi-directional system, we were able to create this sense of unity. In fact, a very large amount of information was being conveyed through the system and that might have been the reason why the students were able to feel that they were together.

So this is the example of the new technologies as applied to our distance education.

Thank you.

Chairman: Thank you very much, Professor Shimizu for giving us the result of your experiment of distance education using a new communications technology.

Next to speak to us is Dr. Ralph Meuter. He is the Dean for Regional and Continuing Education and Associate Vice President for Academic Affairs, California State University. I understand geology is his expertise, and he obtained a Doctorate from Oklahoma University in geography. He will be talking about the distance education program using the ITMC network.

R.F. Meuter: I, like my colleagues, am honored and privileged to be here with you during this Symposium. I have learned a lot. I hope to share some things with you about a single institution located in the rural environment and the rural part of northern California, a highly developed state. Yet we used telecommunication technologies to solve problems of overcoming distance and time to provide educational services to the citizens of northern California.

What I hope to accomplish this morning is to illustrate that a single campus of a relatively conventional nature — California State University in Chico is a conventional American university has taken the opportunity to develop the utilization of these unconventional delivery systems and thus the coupling of the innovative along with the traditional and conventional. Weve had an opportunity yesterday and today to hear of

unusual institutions developing with the special purpose to supply educational programs to clients throughout the nation or significant segment of a place. I want to emphasize that my descriptions deal with a conventional university that is going on doing some non-conventional things.

What I plan to do this morning is to first set the scene and describe to you this place of California State University at Chico, some developments and the evolution of our programs using electronic technologies to deliver distance education programs, and then, after that description, to identify what I call the basic underlying philosophies. I'll be examining what we have learned, what can be applied to all experiments of this nature and thus to the success of our students in the teaching and learning situation. So, first of all, I would like to cover the background and introduce California State University at Chico.

I hope that you don't mind my speaking from this distance. Is the sound okay? California State University, Chico is a medium sized university located in the north-eastern portion of the State of California. You can see on the map the illustration of the precise location. The university is a member of a 19 campus major university system in the State if California called the California State University system. Each of the 19 campuses are illustrated on this map.

Some statistical information regarding the California State University system is at the top of this slide. I did mention there were nineteen campuses in the entire system. On those campuses well over 300,000 students are being educated in the State of California. We have a faculty in those 19institutions approaching 20,000 individuals. It is a very large system of higher education and it is growing at this time as the State of California is growing and the higher education needs of that State are growing.

Just for your information, there are two additional segments of public higher education in the State of California, the University of California system with campuses at Berkeley, U.C.L.A. and 6 other locations is familiar to you. The third segment of public higher education in California are what we call the community colleges; two-year institutions of which there are well over 110 different locations in the State of California.

Lower on this slide is some information about the campus at Chico. Chico is the second oldest of the campuses in the California State University system. I emphasized earlier that it is a relatively conventional American university located in an isolated rural region. While middle sized, we have about 14,000 undergraduate students, 13,500 full-time equivalent, that is those students who they are taking a full load of 15-semester units. We are primarily an undergraduate institution with a small amount of graduate programs. I list the individual colleges at the university to indicate that this is a conventional educational and academic organization. There is nothing unconven-

tional about this institution other than our heavy use of telecommunication technologies. We have 8 colleges that are listed here with faculties and departments of a standard variety. We offer a little over 52 Bachelors degrees and about half that number of Masters degrees.

It is important to understand the location of Chico in the State of California to realize that this is a rural part of northern California. It tends to be isolated by geography; that is, there are very few people in this large area. Most of the economic support in the area is determined by agriculture, forestry and some mining. This illustration is known as the educational service area for California State University, Chico. It is in that area that the university is responsible to provide the higher educational programs to the residents in that part of California.

There are a relatively small number of residents in that area, because most of our students are derived from the Los Angeles basin and the San Francisco Bay area. However, we are responsible to supply educational programs to rural northern California. In the past, the way those programs were delivered was simply by putting faculty in automobiles and sending them out on the highway for 3 and 4 hour drives to go to small towns where they would visit with students and offer classes. It was very, very inefficient both economically and some would say instructionally. What we developed fifteen years ago and it now has been in operation for over 15 years is a program that we call instructional television for students. This is a land-based or terrestrial microwave system which shares the live and interactive classes originating on the university campus. There are regular students on the Chico campus sitting in the classroom, being taught by the regularly appointed faculty member to not only the students on campus, but also to the residents described on the map behind me.

These are programs that can be completed completely at the remote site. It is not necessary to travel into the university for any of the services that can be had at the main campus. It is our goal to provide the rich variety of services remotely to these students also using electronic means. This is a one-way video and two-way audio system with classes from throughout the curriculum. There is no particular specialization of the curricular offerings. A factor that I am convinced is true is that the course can be successful if the faculty member wants to make it successful using these technologies. The reverse of that rule also holds that if a faculty member does not want to make these programs viable over electronic technologies it will not be successful.

I leave this slide up in addition to illustrate one site. It is here to the south, that is a community known as Roseville, California. It is on the outskirts of our State capital at Sacramento. It is the beginning place for a developing second Silicon Valley in the State of California. Most of you are familiar with the current Silicon Valley centered on Palo Alto and San Jose in the South Bay. In the last 5 to 10 years, this Rosville corridor,

north of Sacramento is developing and appears to be more fully developing. I point that out because at that location 10 years ago, the Hewlett Pakcard Company opened a new manufacturing plant in Roseville. When they opened that plant, they were aware of Chico States Television Network and they requested that their manufacturing plant be designated a receive site for the land-based system that Chico had developed.

They also requested that we put regular university classes of one of our strongest academic programs, that is computer science, on this system. So some 10 years ago, we developed the strong relationship with Hewlett Packard Company and began offering classed leading to the Masters degree in computer science to that single site about 100 miles south of the campus. As time has passed, our faculty and the Hewlett Packard engineers as students have evaluated the program positively. We have moved in to the next level of delivery, using a different technology; 5 years ago almost to this date the same individuals from the Hewlett Packard Company at Roseville returned to the university at Chico and requested that we offer a Masters degree in computer science beyond the Roseville site. The Hewlett Packard Company at this time had a need to provide quality educational experiences to their electrical engineers, as their company intended to transist those electrical engineers from hardware dominated people to computer scientists. They asked the university to assist. At that time, we were investigating a much more extensive land-based or terrestrial microwave system but it became very obvious that their needs within the company were beyond what microwave connections could be developed and we proposed a satellite-delivered live, full motion video program that began slowly — that is, with just a few states 5 years ago and with 5 sites in the State of California, and a single site in Boise, Idaho for Hewlett Packard. That program worked very well based on the same concept as the previous program that I described. The instruction is live and interactive, with one-way video, two-way audio using telephone, standard telephone instruments to talk back into the classroom. It is realtime instruction and there is an important subtlety in the psychology of learning that we have discovered about realtime, live interactivity versus delayed video tape and other methods of delay. We are committed to this live and interactive delivery.

After the first semester of this experiment, I should note that the Hewlett Packard Company entirely funded this experiment for the first year inclusive. All satellite transponder time, all faculty costs, all administrative costs, the entire program was funded without question by Hewlett Packard. It was a wonderful experiment for educators to be involved in. It is not the type of experiment that we are normally accustomed to. This one was first class all the way and has remained that way.

As the program developed that first semester, it was evaluated very positively and we watched the second semester expand into 5 states. We launched into a 5 state

network, all Hewlett Packard, in Washington, Oregon, Colorado, Idaho and California. Again, quite successful, the program looked like it was ready to go forever.

At the end of that first year, the Hewlett Packard representatives returned to the universitys campus at Chico and deemed the experiment a success. They, however, offered a challenge that we had not expected. They said we are willing to support this effort totally, the first year; we now know it works; we want to challenge the university to take not only the academic risk but the financial risk of carrying this program out on your own. For those of you involved in public higher education institutions, you know that was a very scary situation for us. We almost clutched. Fortunately, maybe we were just lucky, but we decided to launch forward. Hewlett Packard representatives introduced us to their colleagues in the private sector corporations at Texas Instruments, at IBM, Alcoa Research Labs and others that are illustrated on the receive sites of this slide. And we currently now have a 20 state network with approximately 200 to 250 corporate employees each semester taking live courses in realtime from the campus of Chico.

I think I will move from here at this point and make some comments of a more generic nature that will hopefully stimulate some thoughts. I wonder if we might at this time show the video tape that I have prepared. Is that a possibility?

(Showing of video film)

R.F. Meuter: Thank you. I would like to make one or two comments as a conclusion to what we have found in our experience which I believe is sharable whether you are developing an innovative institution and delivery system or simply using an innovative delivery system to share conventional programming to students and clients who have not had that before.

First of all, we feel very strongly about a live and interactive system. We realize that other methods are adequate but given the choice there are certain significant subtleties about the psychology of learning, that the live interactive situation emphasizes. If a person makes a decision to be at that class they have said something about the priorities and the importance of that class which is very different from saying I cannot go to my class at the time that is appointed. I will watch it later because something else in my life is more important. There is a significant subtlety about that decision-making process of the importance of the academic program and the training situation in a company.

The technology as a second point should be transparent. All of us say that and we all attempt to pull that off. Yet in fact, when we are best able to do that, our successes are greater. We sometimes become dazzled by the gadgets, as I call them, but we must remove those gadgets and have the basic fundamentals of teaching and learning take

precedent over technology. The technology must relate to the instruction going on.

Instruction must be provided to the remote student and all of the service to the remote student must be integrated into the program, simply providing instruction is not as powerful as instruction plus all of the services of a university experience. That is where a giant challenge is in front of all of us. Most of us have figured out whether to use audio, video or however to get instruction to students in remote areas. What we still have in front of us are the remainder of the services and rich environment that a university provides, that we all experienced. It is something ephemeral; it is difficult to describe but it is there.

I believe that we should use the existing policies and procedures. We do not need to develop a new bureaucrats policy manual or procedure on environment for simply a different method of delivering the instruction. Our old tried and true policies and procedures ought to work. If they don't they ought to be changed. However, the separation of distance technologies should not imply the development of new policy.

We should treat students in an equivalent fashion, whether they are on our campuses in a conventional setting or remotely isolated from us. It should be our goal that those students are equivalent in every way.

Finally, we need to be assured of ourselves. We need specialize and differentiate the functions of developing these distance delivery technologies. The content area must be developed by the academics, by the educators, the professors. The conduit or delivery system needs to be developed and maintained by the technicians and the engineers. The programs need to be developed for specific clients, be they corporate training, regular students at a college or university, elementary or secondary students whatever the program should be developed for them. And most importantly, a fourth function of coordination of those various other functions I just mentioned, content, conduit and client must be interfaced to have a successful program. The results of using educational technologies to deliver programs are amazing and the opportunities that they present us are only limited by our imaginations. I appreciate the opportunity of being here with you and hopefully we will have some time to respond to any questions you might have.

Thank you.

Chairman: Thank you very much, Dr. Meuter. His presentation covered the overall application of satellite microwave all the way to the application of the satellite. The next presentation is by Mr. Kamata who is the president of NEC Institute of Management, Ltd., after serving in an important post of chief of education section in the Education/Training Department and general manager in charge of R&D Administration Division.

T. Kamata: Thank you, Mr. Chairman, for your kind introduction. We have received various support and cooperation to the works of NEC by all the participants here so I should like to express our appreciation to all of you for supporting us and also it is my great privilege and pleasure to be able to take part in this highly sophisticated academic symposium of International Symposium on University Distance Education.

I would like to present the example of satellite-relayed educational system for employees of our group of companies at NEC. Our in-house educational system is called NESPAC which stands for the NEC Satellite Pedagogical Network for Advanced Creative Education. This is the acronym we use. Let me explain to you the background of our decision to introduce the NEPAC. In doing so I would like to explain to you the history and background of NEC Corporation and the group of companies.

NEC Corporation was established in 1899 and went on to specialize in Computers and Communications, C&C and we are celebrating our 90th anniversary this year. Through the past 90 years the business areas we engaged in have changed, developed and diversified, especially after 1964 under the leadership of Koji Kobayashi. Under his presidency, the policy of business expansion and internationalization have been promoted.

As a result, we have seen a thirty-six times increase of our sales between 1964 and 1988. And this transparency shows the current profile of our company. The major areas of products would be communications, computers, electronic devices and home electronics. In deploying these business activities, NEC began the work of dispersing or distributing plans in various locations starting sometime around 1969, because we began to feel the shortage of young labor force.

It was very difficult to recruit young work force in a metropolitan or the central areas, so we decided to distribute our plant locations to other local areas. Some time around 1975, our works in software area increased very much so we established the series of subsidiaries specializing in software. The first of such subsidiaries was established in Tokyo. However we could not secure enough work force in Tokyo so we established in local areas by and by and now we have subsidiaries and plants throughout the country in 32 entities from Sapporo in north and Naha in the south.

While this kind of distribution policy to local areas was conducted out of the need of the company itself, at the same time it greatly contributed to the revitalization of local economies. In addition to newly setup subsidiaries, NEC Corporation has increased its number of branches across the country. As the result of that, about 60% of the NEC Group's domestic employees work outside the metropolitan areas.

In the NEC Group as a whole, we began to feel very keenly the importance of cultivation of human resources because human resources is the pillar supporting the development of our business.

Therefore, in 1983, we established the NEC Institute of Management, Ltd., which is the company specializing in the in-house training and education of our employees within the NEC Group. And this Institute now offers educational and training courses for executives, supervisors, production system personnel, employees of overseas affiliates and personnel going abroad.

Our program covers our employees from the management level to the ordinary employees. Our Institute also offers an educational system via satellite called NESPAC, which is the subject of my presentation this morning. As this transparency shows, in NEC Group we have a various entities and department in charge of training and retraining in addition to the NEC Institute of Management, Ltd., Human Resources Development Division, Personnel Relations Division, and also NEC Technical College, Institute of Technology Education. Not only the NEC Head Office but subsidiaries have the section in charge of these education and training, so we share the burden with each other and cooperate together.

Could you go back to the previous transparency describing the total number of our employees? As I mentioned earlier, in NEC Group as a whole we have 58 subsidiaries overseas and 124 subsidiaries or companies in Japan so the total number of affiliated companies in the NEC Corporation Group is 182 and the total number of employees are 158,000 altogether.

With this large number of employees in NEC Group, the need for the education and training and volume of contents of education also diversified. From 1975 to 1985, as you can see, the number of recipients of the educational courses and the number of courses taken by a employee per year have increased. From a different angle, there was an increased need for in-house education. We conducted a survey of the engineers asking them the question after graduation, how many years did you feel the gap expanding between the current necessary technological level and what you acquired in universities? For 1 to 2 years, only 8% felt some disparities, but after 11 to 12 years after the graduation, as much as 58% of the employees felt that there was disparity between the state of art technology and what they learned in the university. This was the time of 1970 to 75. However from 75 to 80, only after a year or two, many of our employees began to feel disparity, 53% of those who entered our company in 1975 began to feel that disparity immediately after entering our company.

In addition to a quantitative increase of the need for education, there was qualitative need for continuous in-house education. The need was so keenly felt by the employees themselves, we were propelled to improve the contents of the in-house education. Our institute was established in 1983.

Let me talk about the contents of the education, the satellite-relayed education. As other professors pointed out, there are various advantages we can accrue from the

satellite education. The first would be the wide coverage and also the simultaneity in broadcasting and the multiplex connectability and the high resistance against any natural disasters and mobility. With a wide dispersion of our activities throughout the country from Hokkaido to Kyushu, we have to provide the kind of education with the same and equal level sophistication we can provide in Tokyo. Our communication satellite education covers 8 centers throughout the country from Hokkaido to Kyushu, Sapporo and Fukuoka and within this year, we will add two more satellite classes. In other words, altogether in 10 locations, the satellite-relayed education will be provided in our Group.

And this NESPAC system has two central classrooms in Tokyo and Kawasaki and have satellite classrooms in Sapporo, Sendai, Nagoya, Osaka, Hiroshima, Fukuoka, Kanazawa and Takamatsu.

This is the central classroom in the NEC Technical College in Kawasaki. This is another central classroom in Tokyo, the training center in Tamachi area in Tokyo. This also is the auditorium in the NEC Junior College and the lecture sessions over the audience of about 400 could be organized and conducted here. This is the scene of the satellite education center in Tokyo. This is in Tohoku, Sendai, organizing the local classrooms.

The classroom consists of about 36 students and 2 TV screens of 70 inches. As I mentioned, in our NESPAC we use a satellite system and also have 2 channels full motion video that can be translated 2 ways simultaneously. By a 2-way communication system, students can ask questions of the instructors and make presentations from any classroom in the country, while their faces are being seen by all the participants in other classrooms.

About the need for two channels of full motion video, as you would clearly understand it is important for the students to be able to watch the faces of the lecturers but at the same time, various images, pictures or printed material or other materials should be displayed simultaneously. Since we needed to have such a device to enhance the effect of the education, we organized this NESPAC based on the 2 channels of full motion video.

In case of this Tokyo Satellite Education Center, as you can see the students can see the lecturer and the other materials simultaneously on 2 screens. As professor Kobayashi and Professor Shimizu explained earlier, there is a need for the interactive 2-way communication; the one-way presentation by the lecturer alone would not suffice since the students should be given an opportunity to respond to the presentation immediately, this ability or capability should be available this way, the instructor can react to students by giving comments and there will be a close interaction between the instructors and students. Two-way communication is an

essential element.

This is therefore one aspect we adopted in our NESPAC system. Another point of importance for our in-house education would be the point to multipoint system. By pressing a button the student can raise questions from any satellite classroom to the lecture in the central classroom. The condition in one of the satellite classrooms could be displayed in another satellite classroom. So that even though the classrooms are a great distance apart, each can have a strong sense of participation. Therefore, a point to multipoint system would enable such participation.

We encourage discussion and debate amongst students in different classrooms in our educational program.Since our start in 1987, 3 years have passed after we introduce the NESPAC and the number of people who use this program increase constantly. On an average, the system is used almost every day. The utilization coefficient in terms of hourly basis is about 85%.

The contents of education are also diversified; software education, management education, English language courses, productive knowledge education, and the maintenance education. Of course, we need the contents and most of the education through NESPAC as you can tell, could be used for management purposes, technologies, technical skills, software, marketing and internationalization. In terms of the modes of education, we not only use one-way lectures, but have introduced the active discussion or debate type of education.

We also conducted a questionnaire study asking for the reactions on the part of students to this kind of satellite classroom education. For example, one question on the questionnaire was, "How do you access this system?" The answer was on a scale of 1-5, and the average response turned out to be 3.95. As a system to convey educational information to distant locations, the student reaction to this sort of system was a score of 4.35 which was very favorable. Based on the questionnaire results, we listed some of the advantages and effects of the introduction of NESPAC.

One is that we can enlarge the educational opportunity throughout the country and this is advantageous for both students and the company. Secondly, we can provide high quality education compared to correspondence education or other forms of in-house education. The content and quality of this sort of education are remarkably higher. Also, the facility of education and learning is much better because the students can have a sense of participation rather than studying alone in correspondence education.

The third advantage is saving in time, that is, the greater increase in disposable time for both students and lecturers when they are requested to come to one place and get together which will require travel time. Students who are requested to come to one of the classrooms nearby their work place are saving much more time. If they were to

travel all the way from Sapporo to Tokyo for a three-day training session, the travelling alone will take almost one day and another day to return home. But using the NESPAC system, only 3 days for the actual education would be needed. Also, this sort of system would facilitate specialists from outside to come and give us lectures. We do not have to expect the specialist and experts to come to a central classroom but only to the nearest satellite classroom.

Concerning the reduction in educational cost, we have not yet fully recovered the investment in a way of return on investment. Over the long run, however, we can save time, we can save companies quite a lot in total educational cost.

Now, before concluding, I should like to list some of the future issues and the ways we shall cope with them. One is the exact knowledge of cost effectiveness and high quality education. How we can structure the educational courses, which are effective and highly needed? In terms of time utilization, the rate of operation of the system is not the highest. We still have some inefficiency and we would like to make usage of this system most efficient and effective.

From the 29th of this month we shall start the satellite business college as an in-house course. And the first one is the marketing course. Through this we would like to provide long-term courses on a continuous basis to improve the efficiency and effectiveness of our educational courses. This shows the content of curriculum.

The second subject we should be tackling would be the improvement of teaching skills and methods. In this university and institute I was impressed by well management of the systems based on the good knowledge of technology and the need for education.

We would like to achieve this steady improvement on the contents of the education in terms of teaching skills and teaching methods and so forth.

The third point is closer cooperation with universities and public sectors. Probably, we could make it into satellite university in Japan by establishing closer cooperation between private sector, universities and public sector.

From 16th to 19th of October this week, we held the NEC International Convention 1989. We have an extensive international network in our business operations and we wanted to establish an international educational network in our Group. Consequently, we organized this NEC International Convention 1989 from 16th to 19th of October in Singapore. Singapore and the NESPAC network in Japan were connected via Intelsat, to conduct a management study session for employees of Japan and ASEAN countries. We used the video conferencing facility of KDD and it was linked up via Singapore through Intelsat. Until the day before yesterday I was there in charge of organization of this conference, and I realized that it is a very effective method to organize the international convention as such. A 4-day conference was composed of

management forum and production forum and the management conference watching and following technology trend as well as area studies.

It was interactive 2-way discussion. We sent information from Japan and received information and views from Singapore. It was a very effective ways of communication and we became more confident about this sort of possibility.

Since the time differnce between Singapore and Japan is only one hour, it was very convenient, facilitating our communication across the national borders. If we extended to different geographical areas, to the United States and the European countries, we may yet face another problem of greater time differences or languages. Nevertheless, based on the achievement mode in Singapore, we would like to establish a global network system of satellite-relayed education. With this, I would like to conclude my presentation on our NESPAC.

Thank you.

Chairman: Thank you very much. In terms of in-house education, you have 8 locations in Japan. You are now expanding your system to cover some points overseas. thank you very much for sharing with us the wealth of your experience in a short span of 30 minutes. We learned a great deal and was impressed by your presentation.

We started our session this morning at 10 oclock, and we have been discussing new media. Within the University of the Air, we worked with the National Institute of Multimedia Education connecting Kumamoto and Saitama and lot of other places using new media in the form of INVITE 64 to give actual teaching environment. This was by direction an audio visual system covering different points, point-to-point connection. This was the first program we heard.

The second one was the NUTN system, a one-way audio using computer and facsimile for 2-way communication using live broadcasting allowing for the use of live sound.

The next presentation was the way NUTN is being used not for strictly point-to-point communication because it is seen throughout the United States. It has an almost two-dimensional coverage across the United States.

The next example was the Tokyo Institute of Technology; 4 bi-directional interactive type of distance education with HDTV was one example. Then we had an example of the USA Chico one-way video and two-way audio plus telephone and then satellite communication was added. I think I heard Dr.Meuter say that 20 states, 250 people were covered and it is now at a developed stage of being able to give Masters degree in science.

Then we had the NEC example. Now, we have some twenty minutes. If you have questions for the speakers, particularly the earlier speakers, we would like to invite

your questions and comments. Please raise your hand, and please make sure to identify yourself by stating your name and affiliation.

S. Futagami: Futagami is my name. I was recently in China helping them develop the University of the Air there. Mr. Kamata, in a country like China with their unique conditions, which would be better the use of optical fiber or satellite? What would be the merits and demerits of using either satellite or optical fiber in a country like China, particularly with a potential of developing an active system? How would you evaluate the advantage and disadvantage of optical fiber and satellite system? Mr. Shimizu and Mr. Kamata. Mr. Kamata first and Mr. Shimizu.

Y. Shimizu: I believe I can refer to Mr. Kamata for a technical opinion, but comparing satellite and optical fiber, one major difference is that satellite can cover a wide area, which means that any place you can put up a dish antenna, you can receive the transmission. Whereas in the case of optical fiber, there is a physical necessity of laying the fiber cable. So there is a limit with regard to the coverage. However, when you look at the transmission capacity, it is the fiber system that provides a larger capacity.

In our case we were able to use four channels for one transform mixer, so the optical fiber system provides a better efficiency. So both have merits and demerits. There are good points and bad points to both but in the final analysis, I believe in our case at least, What we wanted was a live sort of atmosphere as close as possible to the live classroom situation. This is why we were more interested in fiber cable system and we were successful in our experiment. However, using optical fiber is not all that unrestrained, cannot be done freely. You cannot try to lay your cable system on any road system. Therefore, if you are to expand optical fiber system, there may be limitations even though the NTT has a plan to establish a network covering the wide area. A system already connects Hokkaido with Kyushu.

So gradually, even with the fiber optic system a wider coverage will become possible.

S. Futagami: What about the vulnerability to disasters?

Y. Shimizu: I believe satellite is stronger in terms of resistance against disasters.

T. Kamata: I think Professor Shimizu has covered everything. I really have nothing to add. I can say, however, that in a large country, a satellite system will be a very efficient means. We use a satellite system in Japan as well and now that the system has been liberalized, private companies have recently entered the e field of satellite

communications. So I guess it will depend on the circumstances, case by case.

Chairman: What about our participants from the United States? Do the two of you have any comment on this issue, satellite versus optical fibers? NO? Okay.

Professor Wakamatsu.

S. Wakamatsu: My name is Wakamatsu from the NIME. I was very much interested in the presentations by various lecturers this morning. I would like to ask two questions.

First, to Dr. Oberle, and then second one to Prof. Meuter, about interactive two-way system. Mr. Kamata explained to us the NESPAC system and also there was a presentation about Tokyo Institute of Technologys full motion picture system.

Now, in your cases, Professor Oberle and Professor Meuter, you have one-way video and two-way audio but in two-way interactive way. Does one-way video, two-way audio facilitate enough interaction between the lecturers and students or the center and the other points? Or is it because of the financial constraint? If it becomes economically possible in the future, do you think it would be desirable to have the full interactive system? Or do you think one-way video, two-way audio would suffice? This is one point.

The second point is that the Masters of Science is provided in the computer or information science. In such a program, is there a necessity for a special educational equipment or training at the receiving site? Or the students or in some cases instructors to facilitate a learning process? How would you react to that, Dr. Meuter?

Chairman: So you are comparing the two-way interactive video with one-way video, two-way audio system? What is your reaction to that, Dr. Oberle?

E.M. Oberle: Yes, I certainly think the two-way video and two-way audio is advisable. However, that limits the number of participants. The meeting rooms for the two-way video and two-way audio are certainly very expensive. With the kind of distribution that we do point to multipoint we look to serving a large number of people that does limit the interaction. However, I think that much of the interaction is a mind set. We try to instruct our sites that they will have an opportunity to ask questions and we also advise them that their question might not be the one that would be answered if we have, say, a hundred or two hundred sites.

However, the likelihood of their questions being answered is great because in a given subject, by the time you ask 20 questions, you probably ask most of the questions that they are to be asked. So in this sense, if the expectations, I think, of the participants are met, that is whats important. Whats really serious is if you do not

think that your question was answered. So part of our orientation to a groups such as this would be to say, "this is how the interactive works. You may not have you specific question taken from you but it probably will be answered." We have other ways of responding if more questions come then we can answer live and those can be answered by computer; they can be answered in a newsletter; they can be answered by fax — but is it very important that we get those questions answered?

R.F. Meuter: On that same question of two-way video versus one-way audio two-way audio, I would conclude that at this point it is so costly to consider all potential receive sites to have video connection back that many of us who are in the field have not considered how to do it because the costs are so outrageous.

Conceptually, at the top of my head, it sounds to me that it would be desirable to have two-way audio two-way video but there needs to be a giant step on cost and not simply equipment cost. As Dr. Oberle mentioned, we are talking about personnel and infrastructural cost at the site. Its much simpler technically to receive than it is to technically originate a facility; its a whole different ball game.

While I am speaking I might address your second question, if you don't mind. As I recall your question, it was regarding special equipment that a Masters degree level in computer science or information science may demand is there a necessity for specialized equipment on the site at the plant? The answer is "no, it is not essential!" In fact, what actually is required, most of these companies have that equipment available to their employees. Even if they did not, there are very simple electronic means for a remote student via modem to connect back to campus computers and campus machines that can do whatever are necessary. Interestingly enough, at a graduate level in computer science, there is relatively little hands-on machine-oriented exercises. It is more conceptual and theoretical and that has not been a problem at all.

Chairman: Are there any other questions? Yes, you have the floor.

H. Ito: My name is Ito from the same institute. Various examples have been shared with us concerning the use of various types of new media. In general I have understood that those experiences have been successful experiences. For you to have had this success, what were the things that you devided or what were the things that you did specifically to bring about certain successes? For example, a format of lecture, program of the course, the way in which the lecturers give classes or courses. Have you had any specific examples of the preparatory work which ultimately brought about this success?

Chairman: Professor Kobayashi.

Y. Kobayashi: Since Ms. Ito is one of the members of NIME institute and has been involved in various projects, I understand that she knows to a certain extent the answer. INVITE 64 system was tried with Saitama Study Center as a host center and Tokyo Second Study Center was linked with this Saitama Center. Both the students and the professors were monitored in this project. Three subjects were the subject of this project: Japanese literature, food or nutrition, and earth science. The Japanese literature subject was the subject in which various questions were asked to the students in an interactive mode. The nutrition of food subject was largely given only in the form of a lecture; it was a lecture time course.

The earth science classes were given by Professor Nasu who did use a lot of images and pictures. So the three professors did try very hard to better appeal to the students with innovative measures. Preparation of various classes given at Study Centers can of course do done, but many of the professors who are giving classes at the Study Centers are outside professors. Sometimes it is very difficult to ask them to take a lot of preparatory time and energy for that kind of work at the Center. However, for this specific study, a lot of preparations were made.

Professor Oberle, what about you, have you had different preparatory work and devised different innovative format for your specific project as against the ordinary preparative work for classroom teaching?

E.M. Oberle: I would respond that because my experience is non-credit, we do put a lot of important creative instructional designs into our national teleconferences but these are non-credit.

Chairman: Professor Meuter?

R.F. Meuter: I think some points might be worthy of mention. One is a commitment to faculty in an honest way, that, in fact, resources and personnel will be at their disposal if they so desire to use it to utilize the technology to improve instruction, not simply to just deliver the same quality of instruction as before.

Another thought that I would have on your question is what I would call the principle of inclementalization, going in slow steps. It has been my experience that to attempt to innovate simultaneously in many different areas usually means failure. It would be wonderful to be that revolutionary and change things that need to be changed. In fact, I believe that it is an inclemental act — a little gets moved and a little bit more and then it is infiltrated into a system and we look back and see gigantic

change.

Chairman: Thank you very much. Do we have more questions?

(Floor): This question is for mainly Dr. Oberle. In the NUTN system, it seems that while you are covering a wide area with many programs, I think you are going to have the problem of copyright. I understand in some cases they charge high tuition, but given that copyrights could be expensive. Do you encounter any difficulties or problems such as difficulty to produce programs because of copyrights infringement.

E.M. Oberle: It has not been a problem since multiple institutions develop programs. They own the copyright. We serve as a distribution system and marketing system for that teleconference. So each institution or organization, if it is an international trade and development, they would hold that copyright. We would respect the fact that if any participant who participates needs to, they have to sign permission that the program can be viewed and distributed widely. So with proper planning, we are able to avoid any problems of copyright.

Does that answer your question?

(Floor): Yes, I understood. But if that is the case, can people take video or record the video of the original program? If that happens another possibility for copyright infringement arises. How can people freely make use of the original program? Can they record video text?

E.M. Oberle: In most cases, all of our programs can be taped for further use. We are in the business of service and providing education. So in most cases, we give full freedom to tape and use those programs however you would like to use these programs.

R.F. Meuter: I think it is a very significant matter. I agree totally with Dr. Oberle that our business is education, to share and open people's minds. We should be attempting ways to involve people rather than cut them out. However, there are some practicalities in life. I believe, we, in the institutions of higher education, the University of the Air included, have some of those things, credit-supplementary materials, for example, that make the program better. Those are things that you can only receive if you register and pay the fees so that in fact there are built-in so-called hooks so that people who want to experience the full benefit of the educational experience will do it.

In addition, the instruction is simply out there for those who are just incidental

learners.

E.M. Oberle: Another comment. Exceptions would be that some of our outstanding speakers are accustomed to being paid a lot for presenting — such as Peter Drakoff, a name that many of you might know. Now we would have to restrict taping in that case. But on each program you are advised whether you can take or not take a program. So, of course, there are those exceptions.

And since our programs are not credit, Dr. Meuter has a different concern with his credit programs.

Chairman: Thank you very much. It is one oclock. I am sure you have more questions that you would like to ask. Unfortunately we are not able to have time to make further comments but having heard the discussions from the 5 Panelists, I was reminded of the heightened need for life-long education. There was a time that only 8% of the people felt the gap between what they planned in higher education and actual life or business but now the percentage is higher, 53%. So there is a greater need now for life-long, continuous education to reduce that gap between the school education and the education that you have to obtain in real life.

In this respect, distance education assumes its own importance. In distance education, the teacher and learners must be able to communicate real time. It was towards that end that we were able to hear the experiences of the 5 Panelists who individually have had their own experience in terms of experimenting or creating systems to allow such realtime communication, real live contacts and communication between people. I think that relates to "high-tech, and high-touch", expressions used by Dr. Oberle.

I believe also that this new media is going to be "technology transparent", the phrase coined by Dr. Meuter. We today communicate face to face in a somewhat closed environment but eventually we hope to be able to have a global network where such close, face-to-face communication or contact becomes possible throughout the globe so that education or things can be learned anywhere, every where. And I think such a day is gradually approaching.

There might have been some oversight on my part as a Moderator because I was too keen on listening to the valuable contributions by the Panelists and I was not able to keep time adequately. However, I would like to take this last opportunity to express our appreciation to our 5 Panelists and also the sponsors, the University of the Air and Institute of Multimedia Education.

With regard to language problem we would like to thank the interpreters who helped us carry on with this face to face communication. Now that I have thanked

everyone, I would like to conclude this part of the Symposium.

Thank you.

Discussion

Technological Innovation and Life-Long Education
— The Present and Future of Distance Education —

Chairman: Moto-o Kaji
Vice-President, University of the Air, Japan

Chairman: This is the last session of this international symposium. According to this program in Japanese, it is supposed to be the *Zadankai*, which means the discussion. The English title is the panel discussion. We have the five panelists in front of you. Therefore, we will be giving the opportunity to each of the speakers, although this could be a separate panel discussion, this time could also serve as the summarizing session of the entire symposium. Therefore, time allowing, I would like to invite all the other panelists or all the other speakers who have appeared previously to make themselves available to contribute to this discussion.

Though I have just said that this could be a summary session, the purpose of this international symposium was not to come to any single conclusion or identify any single direction in which we should pursue our activities. Since we have the participation of people with varied and different background and experiences, we are grateful to have received their views about the life-long education issue as well as distance education which for all of us is one major mission or task. To the extent we can learn from each other, I think this symposium has been successful and a great help to us.

So, using the remaining time I will be asking the panelist to state their impressions and their views, and then open the session to the floor for comments from the people in the audience as well as other speakers.

Incidentally, my name is Moto-o Kaji, Vice President of the University of the Air. I have been Vice President since May of this year. But the preparation for this symposium had begun even before May this year. Mr. Kobayashi, former Vice President, who was one of the speakers this morning, was very much involved in the preparation of this symposium. I must therefore acknowledge the efforts that were made by the committee headed by Mr. Kobayashi in preparing for this symposium. I came in only late, only providing some behind-the-scenes assistance. However since I am presently the Vice President, I have the honor of chairing this session.

Since we have five panelists, I was wondering in which order I should ask the

panelists to speak. However, I thought it will be best to give the speaking opportunity first to the participant who has not spoken up so far, and that is Mr. Hojo, President of Shinshu University. So he will be the first to speak.

Prof. Hojo has been President of Shinshu University since 1981. He has been teaching chemistry and in addition has been is instrumental in various new projects or activities that his university is engaged in.

N. Hojo: Thank you very much for giving me this opportunity to be the first to speak or to break the ice so to speak.

As was mentioned briefly by Mr. Kaji, we are presently trying to establish an image information network. There are many reasons for our coming to the decision to create such a network. As you may know, our university is very unique in that our organization is spread out throughout the prefecture in five different locations and our prefecture is very much mountainous. There have been efforts, therefore, in the past to bring the campuses together. However, the various locations are all deeply rooted in different localities and have close relationships with the local community. It has been difficult therefore to try to unify our organization. But today we are seeing a rapid development of inter-disciplinary academic fields. Furthermore, in the prefecture of Nagano, there is a plan to set up a technopolis. In fact there are five plans to build up technopolis at five different locations in Nagano. In the meantime we are seeing great sophistication and advancement of various disciplines in academia. Therefore, now we are hoping to be able to maintain the present structure of the university while creating a network to link and connect all of the different campuses. Since we are, as I said, a very much spread-out organization, we are trying to keep up with the times by connecting ourselves in a form of network. Hopefully we want to create a network which will make use of various technologies to allow us to have an image or picture information transmission through the network.

Tokyo Institute of Technology, as we heard, conducted an experiment connecting two campuses over a distance of 26 km. I think relatively it was easier for them because the similar system in our case would involve 200 km and the mountainous regions that have to be overcome. Very much money will have to be spent even if we ask NHK or NTT to come up with technology to make that available to us.

Since we are a national university the government will not be very forthcoming in providing us with the budget and furthermore we will need to ask the Ministry of post and Telecommunications to give us communications band allotment, so that we can use an appropriate communication band. This will require much time for preparation.

In our case we have studied — I have myself been involved in research and study in this respect for several years in the past. Finally after extensive preparation, in 1985

we came up with the decision to create this in two years' time. This created some controversy in the conditions that have to be met before we are given the communication frequency allotment. Therefore, I solicited the views of many experts and I compiled those views. On their behalf I was responsible in submitting the request for the frequency allocation by the Ministry of post and Telecommunications.

The fact that we made this announcement in 1985 was a rather drastic and bold step, but thankfully things have been moving rather smoothly. We are now connecting into our system the third campus, the one in Matsumoto. The distance there involves 70 km. Luckily in Nagano Prefecture there are some mountains whose altitude is some 2,000 kg so we can easily set up antennas on top of those mountainous plateaus. The University of the Air and Tokyo Institute of Technology have presented us their experiences this morning. It would have been better if I were prepared to give you similar reports accounting for what we have done. However, I have not prepared myself. To the extent that I heard this morning, I think the situation has been the same with us.

Students have already been involved in our project. The evaluation has been positive. Simply because something that does not exist came into existence anew, they were very impressed that is one thing. Undergraduate level students who are not yet majoring in subjects during the first and second years, they were very impressed by the system. So, once we made our start it turned out that our project was received very well by the students.

The classrooms, however, are still old classrooms, and we have added some 16 TV cameras, although the positions of the cameras are not necessarily optimum. Therefore, if you keep watching the TV screen you may develop a headache or a neckache or whatever. So we do have small problems.

Also the research part of the university activity is still confined in a small laboratories, we have an idea to incorporate them into our network.

Nagano as I said has a technopolis program. It also has a program to promote life-long education which is directed at people in general. There has to be well-trained instructors to provide such teaching to the general public. We have been taking part in the open seminars of the Institute for Multimedia Education for the last five years, which have been the opportunities for us to train and develop our own instructors.

Between Nagano and Matsumoto the connection has been in existence for one and a half years already. Unexpectedly or beyond our expectations the acceptance has been very good. As has been mentioned this morning, the evaluation may begin to go down as people become used to the new system.

TV conference has been used to some extent. As in the case of the Tokyo Institute of Technology example, it is the live two-way communication. Since we have 5

campuses within the prefecture, when this system is completed, this will connect five of the campuses all together, simultaneously, through the two-way video and audio network.

I am not an expert in this technological field, neither am I a specialist in education engineering. My field is chemistry. However, by using this network particularly at the graduate school level, we are attempting to provide a linkage between different disciplines, given the development in the field of academia in a very much interdisciplinary way.

One idea was how to convey experimental information in chemistry. I took part in this symposium when it was held for the first time and I was very impressed that some of the programs in the United States involved the Masters degree. I was interested to hear something about the delivery of chemistry information particularly in regard to experimental information in the United States. However, so far I have heard nothing of the situation in the United States.

What we are trying to do in terms of chemistry experiment is to be able to allow students to smell the experiments, the smell of the gas or allow them to feel the progress of the chemical reactions. With their sensory skills, students can experience chemical experiments. The biggest problem is how that can be done on a screen through an image.

Our topic today is life-long education and technological innovation. There needs to be, therefore, the technology innovation to allow us to have such a system that will allow the students to actually feel experiments with their senses.

In your handout there is a small suggestion that I would like to bring to you incorporating my ideas about how chemical reaction can be conveyed.

Simply letters or symbols cannot be used to convey information on the same screen that is used to depict the experiment in progress. If numbers are flashed somewhere, peoples minds tend to get concentrated on that information only. Therefore, they would neglect what is going on in the other part of the screen, neglecting the actual visual progress of the experiment. Therefore, what I am suggesting is to have some schematic representation of the chemical reaction in progress to allow students to see what is the degree of acidity, whether it is base or acid, whether the temperature is low or high, whether the pressure is low or high, whether it is an ester or an ether.

Depending on the color the concentration could be identified and by flashing these symbols people or students can know that that particular reaction is occurring at that particular point in time. Even if one were to accept this kind of proposal, if these were to be workable, these should not be accepted only in Japan but as a standard throughout the world if the chemical reaction were to be understood on screen by

everyone. In that case, I think we should be able to have means to convey these chemical reactions live and in a raw form, so that students can understand them.

One suggestion is that in a regular TV if you see somebody drinking coffee there may well be some indication on the screen of the sweetness and the temperature of the coffee that is being consumed. Of course, that is one idea. Whether that would lead to human happiness is another. Such information can be misused by somebody to the detriment of humankind.

There has been a suggestion to develop a TV with odor or smell. However, smell is a sense that remains with the human being often leaving not a very comfortable impression. So, there are very many problems that one has to address in the development of these information networks. That is the impression or question that I would like to leave on your mind.

Chairman: Thank you very much, Dr. Hojo.

As a means of supplementing the conventional means of education, I understand that you are now experimenting with new ideas. I think your work is in many ways related to the projects that were discussed by the panelists this morning. We would hope to have discussion on your subject. However, in the interest of time, we will have our discussions later all together after we will have heard from the other panelists.

We have foreign participants as well on the pane,three of them. We will be going by alphabetical order here. According to the order of ABC, Dr. keith Harry would be the first among the three foreign participants to speak. He was one of the speakers yesterday, so I hardly need to introduce him again except for just one word. He comes from the Great Britain. He is the Head of the International Centre for Distance Learning of the United Kingdom.

Dr. Harry, please.

K. Harry: Thank you very much, Mr. Chairman.

I would like, if I may, to concentrate upon the subtitle of todays discussion, even on a part of the subtitle, namely the future of distance education.

As you would expect from someone who collects a diversity of information from all parts of the world, what I am going to give you now is a diversity of thoughts. I would like to throw out some ideas, some of which have been discussed in the course of the meeting already. Some have simply been referred to, others have not been raised at all. And I would like to begin by talking about, if you like, my hopes and my predications as to what may happen in distance education, starting off with the area with which I am most familiar, which is information, speaking briefly about the two international organizations with which our Centre has a connection, i.e. the commonwealth of

Learning and the European Association of Distance Teaching Universities, and then saying a few things in general which don't relate to any other previous topics.

If I may start with my own topic, information, my hope for future years is that we will see the development of a series of documentation centers which undertake the same kind of work as our own center at present. I would very much like to see the development of an international network of documentation centers to make information accessible much more readily than it is now to people who are working in distance education, be they planners, researchers, academic staff, administrator, whatever their role. I believe, as you would expect, that information is particularly important. It is an area which has been talked about a good deal and into which very little cash has been put until now.

There was some possibility that the Commonwealth of Learning could sponsor or encourage the development of some regional centers which would have a documentation or information function. I think that is not very likely to happen in the immediate future. There is a problem I think with the establishment of regional centers. It is in many areas a political problem. For example, if a regional center is to be established to serve Latin America, which country do you base it in? If you wish to establish a regional center in the Indian subcontinent, which country do you choose? However, I believe that there will be the series of centers established possibly on a national or an institutional basis rather than a regional basis.

And I foresee the development of certain technological innovations which are in use to some degree now. We have had the opportunity to use on-line data bases for many years. I foresee their development continuing but at the same time paralleled, perhaps even replaced by the use of a newer technology CD-ROM. It will be very interesting to see what effect the compact disc has on the future of on-line data bases.

My hope is that the additional documentation centers which are established will each be able to contribute to a central catalogue of information on the literature of distance education. And I hope also that there will be cooperation on the collection of information on institutions and courses in distance education.

Additional technologies which I foresee being extraordinarily useful in the information field are electronic mail for informal communication and computer conferencing to enable people to contribute information to specific topic in which they have particular interest and to pick up information which other people have contributed.

I think we are reaching a point now where it is possible to produce a good bibliography or a list of documents on particular aspects of distance education, which we can send to any point in the world. This is useful but if you are someone in a developing country, a list of references is probably hardly worth the paper if it is

written on, if you cannot obtain the documents to which your references refer. I believe that a future activity is the development of some kind of document delivery system which enables the supply of documents as well as information to institutions not only in developing countries. I think we have an information explosion but we also have a problem whereby documents are printed often in relatively small numbers. They go out of print very quickly and become totally unavailable.

That is my own personal interest. And forgive me if I have dwelt on it rather over long. Let me go on to speak briefly about the Commonwealth of Learning.

The major overall aim, I would say, of the Commonwealth of Learning is to improve opportunities for students and potential students in developing countries. The idea of transfer and of adaptation of courses is currently being discussed. Until now the experience of institutions transferring and adapting courses is that these are very difficult processes and I would foresee that it is more likely that the Commonwealth of Learning will be involved in developing course materials in new areas, development of new course materials rather than transfer and adaptation, I suspect. And one of the major reasons I think is the reason which Prof. Oberle mentioned this morning, the not-invented-here syndrome, the reluctance of staff and institutions to teach using materials which have been produced in other institutions.

I think the Commonwealth of Learning will provide more training opportunities and will encourage staff exchanges which I would foresee as an encouraging development.

Within Europe and I dont really propose to say much about the European Association, but mentioning Europe there has been a brief reference to what happens in 1992 when the single European market is in place. I will just mention two implications. One is that European institutions will be able to enroll students from other European Community countries. I believe, but I am not completely certain, that it would be illegal for institutions not to enroll students from other countries. And the implications are just enormous. I believe the implications for the Open University in the United Kingdom are particularly serious, because many people in European countries outside the U.K. speak English, whereas certainly not many people in the U.k. are particularly fluent in other European languages. So I think the implications of the enrollment question are very considerable.

There will also be the possibility of offering courses Europe-wide. In fact some courses are already offered throughout Europe by an organization called Europace which uses satellite technology and video. The Olympus satellite is offering a free channel for education programming. And there is a committee which has been established to plan the courses and other materials which will be offered. This offers tremendous opportunities especially in the areas of business studies and science and

technology perhas particularly computer technology, involving the private sector as well as the public sector.

There is a little Open University experience here already in that the university is hoping to use some of its time allocation to broadcast some science and technology updating programs. However, it has already run into problems with copyright. The materials which have been incorporated in the TV programs obtained from other institutions or from other sources, a third party material, have not been cleared in the original courses for Europe-wide distribution. It has only been cleared for use in the U.K. So, there is a reason implication because this will cost a good deal of money to extend the copyright to cover Europe.

It is also my hope that the European communitys programs which relate to distance and open learning may assume some more coherence than they possess at the present time. There are, it seems to me, many people in many European institutions who are spending their whole working life completing proposal forms for grants from the European Community. And a tremendous amount of time is being wasted. I hope that this will change. I think this is a vain hope. I am sure it will never change.

As far as the rest of the world or the world generally is concerned, I foresee the development of several more big national distance teaching institutions, particularly in Bangladesh and Tanzania, where committees have been set up to investigate the establishment of such institutions. I believe that in the bigger distance teaching institutions continuing education including vocational courses and training courses will assume greater and greater importance. I also believe that many more small distance teaching projects and programs will arise and that many of them will be combined more and more closely with face to face teaching. I believe that the theory of convergence which has been expressed quite frequently of late is one which will be reflected in the experience of many institutions.

One European development which I foresee happening more and more frequently is the production by distance teaching institutions of packs which can be used independently, self-standing packs which are comprised of printed text and video cassettes or audio cassettes. These packs may be used by individuals to study or they may be used for group study. There does appear to be considerable demand for this kind of material and there is a considerable need by most institutions to actually earn more revenue. This is one way in which I think this will happen.

Two more thoughts finally, which are on topics which are really not being raised at this seminar and probably they are not with in the limits of the seminar.

One is developing countries. I mentioned developing countries earlier on. Our Centre has received money recently from the British Governments Overseas Development Administration to provide support to the Commonwealth of Learning.

The principal benefit of the funding is intended to be for developing countries. I will simply make the point that developing countries are likely to continue to struggle. I feel that they are in many cases very little closer to being able to use high technology than they were ten years ago.

The final point I would like to mention is the possibilities which exist within distance teaching institutions for disadvantaged groups. There are disadvantaged groups which must rely upon distance teaching institutions since they may find, if they have for example physical disabilities, attendance at conventional universities very difficult. And this is a subject which has not been raised at the present seminar and perhaps should at least be deserving of a mention.

These are a series of rather rambling thoughts and I hope that there may be some topics there which will be discussed at a later stage, and I would like to conclude there, Mr. Chairman.

Chairman: Thank you very much, Prof. Harry.

Prof. Harry has listed many topics for our future considerations as well. At the end of his comments Prof. Harry mentioned the role to be played by distance education for the people in disadvantaged positions or the disabled people, and so forth. President of the University Prof. Koda yesterday explained our university but because of the time constraint did not go into details. There are quite a few disabled students in our university and the percentage of the disabled students to the total enrollment is much higher than other ordinary universities. To that extent, we have already been playing some role, but it is obviously something we should be directing more attention to from now on.

Now, if I may, I should like to invite Prof. Morrison to speak. Prof. Morrison gave us a keynote speech yesterday and does not need any introduction. So I would like to call upon Dr. Morrison right away.

T.R. Morrison: Thank you, Mr. Chairman.

I will make my remarks brief, so that we can put into practice hopefully here our discussions of the interactive capabilities of modern technology.

Briefly what I would like to do though, if I can, is to formally thank the co-hosts of the conference, the Institute for Multi-media Education and the University of the Air. The Conference has been exceedingly well organized. It is a product of a lot of hard work, and I want to personally thank both organizations for all the work in putting on what has turned to be an absolutely superb conference, which I think will make a major impact not only in the development of both institutions but more particularly, in terms of distance education. So, I would like to thank all of those who have been

involved in the conference, and it has been my pleasure to be invited.

I will just try, if I can, to give you my thoughts as I have listened to different people speaking abut the question of life-long learning and distance education and couch them to some extent in directions that I feel we are going to move in collectively.

The first point I would make is that this conference confirms the view that I have always had, which means of course everyone is tremendously wise. And that is that there is no such thing as one model of distance education, or open learning in the world, nor should there be. There has been a tendency in this field, particularly if I can refer to what Dr. Harry was saying, particularly in the developing world at the outset to seek to model an institution. I have had that experience and I have seen a bit of that in India and to some extent in Thailand. Certainly I have seen bits of it in China. I imagine in the case of Japan, when you were in the planning stages of the university, the initial inclination might have been to look for an existing model. I know at Athabasca University some people were strongly influenced by the work of the British Open University. And the British Open University carries a particular cross in this field. Since they were the first, they tend to be the place where most people visit, not because they are promoting their model but they tend to be the place that people visit.

What I am pleased to see is that most countries in the world are in fact developing models which have some generic characteristics but are quite different. They differ according to the cultural circumstances and what is available in terms of delivery. the case in point would be the example of Japan.

What has struck me as the major difference between the Japanese approach to distance education and what you would see in Canada, for example, is the extensive use of broadcast television. You use broadcast television, I would assume, in part because you have such a tremendous development of broadcast television right across Japan. One thing that strikes me in Tokyo is the number of microwave towers that I see. Now, we have in Canada nationwide broadcasting but nowhere near the kind of infrastructure that Japan has. On the other hand, in Canada, from the technological point of view, we have a very good telephone system. So, if you come to our Athabasca University you are going to see a lot of use of the telephone system. Some use of broadcast television but nowhere near as much as you would use in Japan.

Each country also has different technological capabilities and different cultural factors that have to be accounted for no matter what system is developed. I think, what we are going to see, — and it is a good thing — increasing over time are a host of different models of distance education around the world from which we will all be able to learn. So, I think we are to the point of maturity where we no longer have to search for one model that will govern the entire world. I think that era is over and what we are going to see is diversity and with that we will see a lot of creative development. I have

been impressed with what I have seen already in terms of the development in the University of the Air and the National Institute for Multimedia Education. So that is the first impression I have.

The second is that in the future it seems to me generally, — and I think this came across very clearly in this mornings presentation — the approach to education problems will not be solved on using institutional response, if I can use that phrase. In other words, if you take the developing world again — but it is also the case in the so-called developed world — we have problems of scale. How do you educate large numbers of people? Not only initially but in an ongoing basis. It is the problem of mass education to some extent. Well, in previous periods of time we were able to use an institutional response. How do you do it? You build educational institutions, so you will find in Canada and the United States — United States perhaps more so than in Canada — universities and community colleges as institutions spread all over the country. In Canada we have that to some extent. And you see that in other parts of the world. That era is over.

The new response in my view will be the response to networks. It will be a networking response rather than an institutional response. You have an example or at least 3 or 4 living examples of that what the network response can look like. The National Telecommunications is an organization, is a networked response. I think as well the Chico case that comes out of the conventional institution, it is a network; it is a networked response. And the University of the Air, as I see it, you are going to put in place, using the University of the Air as the base, really higher education learning network across Japan. You are not going to build institutions; you are not going to replicate the University of the air building right across Japan. The reason for that is : a) costs no one can afford, b) the technology allows us to do it today. And it leads to an interesting kind of challenge and from my perspective, from our policy perspective, that all nations of the world today are going to have to do two things simultaneously. They are going to have to develop their national higher education systems as national higher education systems. However, they are going to have to, if I can use a phrase from the computing world — those systems are going to have to have an open architecture. They are going to have to link with pan-national learning networks at the same time. A good example of that came from the private sector today in the discussion of the next stage in the development of NEC training internal training system, which is in fact therefore NEC but is going to be within the NEC environment a global, pan-national, really pan-national learning network. So, all nations have to do two things: To build a strong and national higher education system but with an open architecture, so one can link to other systems that have been put in place with the same kind of open architecture. That is going to be a tremendously exciting kind of development and one

in which we have very few rules to guide us. In my view, it perhaps marks the second major stage in the development of educational systems in the 20th century. I think that will be the form, the structure for education of the 21st century. The living and breeding examples of it are around the world today. So, that will be my second point, which is that currently and in the future, states or nations will be looking for a networked as opposed to institutional solution to the educational challenges and problems that they face.

The third point I would make goes to some extent to my colleague from Australia. I am not going to debate him whether the television are to exist or not. My point would be that what we see now is somewhat different. Television will no longer be a stand-alone media, nor computers, nor radio. One of the fundamental things that is occurring in technology, whether one likes it or whether one doesnt like it, is that it is all being integrated. So you are going to be able to not only see the television but you are going to be able to interact by a computer based mechanisms that are part of it. You are going to be able to access data in a variety of different ways to CD ROMS and other kinds of things. So, what we are talking about occurring is a multi-and integrated media context not just for education but in our world generally. Tt at is what we are going to see. Now the educational potential in that environment is quite significant. It is still only a potential because what is happening is that the people inventing the technology are too far ahead of educational thought. And there is a danger and I would echo that there is a danger if new educational concepts are not developed and that in fact we would have to develop those educational concepts within a technological fence. On the other hand, the challenge for educators —this is where I perhaps differ — is not to point the finger at the people developing the technology and argue that they should either slow down or stop. The challenge for educators is to come forward and work with people developing this technology at the beginning, not once it is finished. We wait till everything is done and then we look at it and try to figure out how we might use it. We have got to get ourselves involved in the actual design of the new media if are going to use it.

One area that is happening actually is in the area of cognitive science, artificial intelligence and that area. There you will find the linguists and cognitive scientists and others working with people on the hard side, the so-called engineering. In any event, it is a multi-media and integrated media context in my view. We are going to have to simultaneously be able to do things that we have never been able to do before. The question is: as always with educators, what is it that we want to do? What is it we want to do? exactly what is it we want to do? Because the technology is there. In fact it allows us to do almost anything we want to do. Our problem is, I think, that as we look to the 21st century we are not sure exactly what it is that we want to do. That is our

question. That is not the problem for the engineers. That is ours. We are to answer it or the technology will answer it for us.

The 4th point I would make is that if I look at distance education systems particularly, how I see them at this point in the development is that they do provide what I call the transition devices toward the new society. I think our societies all around the globe are changing fundamentally. Where distance education comes in, it is almost like a bridge with these large scale systems: it can almost function as a bridge from the major helping societies that learn about change. That is what I was intrigued withlistening to different people talk about the kinds of programs, the types of things that are being put on the distance education and open learning systems. The content, what kinds of things are we putting in? I am interested to see in the Japanese context not only at the University of the Air, — I had the opportunity to visit NHK earlier in the week — it was interesting to see the kinds of things that are being put on these large learning highways. And it would seem to me, that raises another interesting issue where we need to debate, because we can become infatuated with the technology. It is an electronic highway. That is all. The question is: what do you want to put on it? And what basis of judgment would you use? One basis for me is: what kind of society are you moving toward, what kind of society do you want? And if there is a gap between where you think you are moving and the kind of society you want, then we had better spend some time — all of us — putting some things on these networks that will allow people to interpret that kind of change and bring about the kind of society that they would like. Now, we have large crisis in the world; we have a major world, global, ecological crisis. No one can escape that. You cannot retreat from that, no matter where you live on the globe. Well, perhaps we are to raise questions and enlarge in distance open learning systems. There is an obligation to inform the populace. This is an opportunity to, in fact, inform the world given the scale of these systems about these kinds of issues. I appreciated listening, for example, to the brief discussion yesterday of the basis of the earthquake in San Francisco. Now, that is something that I would bet right now that half the people in the United States would appreciate hearing about. Because they are all probably checking bridges and everything right now. That is my point on the idea of social change.

There are just two or three other points quickly. I think we are at the point and we will see it in the next decade, in which the idea of globalization of learning becomes a reality. I think what you are going to see is a networking amongst larger and smaller distance and open learning systems. I think you are going to see joint course development across national boundaries, and you are going to see courses developed by 3 or 4 different institutions and 3 or 4 different countries, offered simultaneously for credit in all of those countries. I think you are going to see that. I think it is going to be a

tremendous development and the cultural learning that will come as a consequence of that will be fantastic. What will make that happen will in fact be the technology of communications that we have. Without it it is very hard. I mean air travel can be fun but it is also expensive and it is not really as timely as it might be. I think we are going to see the true possibility of the globalization of learning and I think that has a lot of very interesting possibilities.

The last point I would make is that in all of this in the distance education, open learning systems, life-long learning, in all of that, the need is very important to keep human learning at the core of whatever it is that we do. You can become so infatuated with either lifelong learning or with new pieces of technology and hardware that you forget that the core and enduring focus of what we do has to be human learning. My own sense is, though, that we are about to see some rather dramatic things occur, that is, by virtue of the technology and by virtue of the softside of that, the software development and the new models of intelligence that are being developed, by virtue of that I think we are about to see the early stages of development of entirely different conceptions of learning itself, entirely different conceptions of learning and human possibility, and that more than a computer will really challenge how we conceive the educational process. that is going to bring on a fundamental challenge abut what our own concept of human potential is, and we had not had a challenge of that nature in centuries.

So thank you.

Chairman: Thank you very much, Dr. Morrison. Yesterday, Mr. Morrison set a very important basic tone for our symposium, and I am very impressed that Dr. Morrison set again a tone of our future symposium and what we should be thinking from now on.

As the third speaker, among our foreign guests, I would like to call upon Dr. Nimpanich from Thailan, STOU. Prof. Nimpanich is the Dean of the School of Political Science of Sukhothai Thammathirat Open University. Please.

J. Nimpanich: Thank you for your kindness.

Before my discussion I have a few words to say. I extremely agree with Dr. Morrison in saying that this symposium is well organized and everyone concerning this worked very hard. I think everything here is systematic. One thing I am very impressed is the team work or team spirit. The symposium makes me understand the meaning of team work or the team spirit deeply. This make, me undoubtedly understand why Japanese developed faster than any other country in this century.

I would like to thank everyone for being very kind to me, making me feel at home.

In my discussion of this topic, "Technological Innovation and Life-Long Education,

the present and future of distance education", I shall raise STOU as the case by dividing my discussion in three main parts.

The first part I want to discuss is the present situation of STOU in using technological innovation and their results of being successful or not. In case of being successful or rather successful. Are there any problems or obstacles? If there are, do these problems affect the present status of distance education of STOU?

Then, in the second part I will discuss: Has STOU found the way to solve the problems? If STOU can find the ways, what are the new technological innovations that STOU should try to develop? And does this affect the future distance education of STOU? If in fact it does have an affect, in what direction?

And the third part, in conclusion, I will try to generalize the present and future of distance education from the case of STOU.

STOU, as I told you yesterday, holds the principle of lifelong education, aims at improving the quality of life of the general public, seeks to increase the educational qualifications of working people, and tries to expand educational opportunities for secondary school graduates in response to the needs of individual and society. To fulfill these goals, STOU established a distance teaching system which uses the following technological innovation to import instructions. The main media is such as correspondence textbooks, workbooks and supporting media such as radio and television broadcast and audio visual aids. In case of main media, STOU sends all instructional materials to the students as soon as they register. In the part of the supporting media, radio and television, I don't want to mention them again, because I told you yesterday, so let me talk about audio visual aids.

For audio visual aids, this refers to tutorial cassette tapes, tutorial video tapes. These are produced for the subjects which do not offer tutorials. To evaluate the use of these technological innovation or mixed media, in 1986 STOU did research projects on "Occupational Benefits of Open University Education". It was a joint research on distance education between International Development Research Council of Canada and STOU. The result of the study in the part of opinions of distance learning system from these 7,230 graduates and certificate graduates who completed their education in the academic years 1982 and 1983. The research finding on the opinion distance learning system based on answers to questions concerning those technological innovations and general views on the distance education as follow. In case of the printed material or textbooks, the majority of the students studied printed material independently from the moment they received them. The study was done according to the stage laid down in the printed materials. In case of radio and television broadcasting this research findings showed that the same results as done by the System Management and Media Research section of STOU that I told you yesterday. In

the case of audio visual media — this refers to cassette tapes —research findings showed that all students listened to the cassette tapes and felt them the most beneficial, and most of the students listened to all broadcasting which concerned their course of studies. And, last, when the students were asked how they study under distance learning system, most of the graduates replied that they received the best results while studying by themselves and they also replied that studying under the distance learning system was the same as studying under the conventional system in universities everywhere.

The results of the study were one of the indicators to show that the distance teaching system in the present situation of STOU that embraces the principle of life long education and uses the present technological innovation is rather successful. Even though the use of the present technologies is rather successful according to the research, some technological innovations such as broadcasting, as Dr. Moore had said in his paper* that on the arrival of radio and television in the first half of this century it was seen as supporting the communication between teacher and student, but its introduction into education frequently failed to correct one-way information flow characteristic of mass media. In other words in Dr. Moor's opinion he thought that broadcasting's only one-way communication and it separate between the teacher and the student then this becomes one of the obstacles or limitations of STOU. But this doesn't affect much as the present of distance of education of STOU because the number of the student each year are still high. However, the university attempts to develop the new technological innovation to help the students study by themselves, more efficiently in the form of two-way communication. As a matter of fact STOU for example have tutorial sessions which are in two-way communication, but only 20% of the students attend the session.

Then, what are the ways for STOU to solve this problem? This will be answered in the second part. Because of the limitations of especially the broadcasting that is only one way communication, then STOU have to find the way to solve this problem and at the same time the way they can also help to reduce the separation between the instructor or teacher and students. At last we found the way and one of one of the them is to use computers as a gateway to provide interactive learning for students through prepared instructional messages. And that is CAI or computer assisted instruction. By the assistance of the University of Guelph, Canada this is a pilot project of STOU which has produced 45 test modulates in three course blocks or three subjects. The first is Science and Society, the second is Economics and Business,

* G.A.B. Moorr, (Chairman, Rural Extension Studies, University of Guelphylunada) "Computes Mediated Communication An Energe Resource For Distance Education and Independent Study"

Statistics, and the third is Mathematics for Social Science. These are the difficult subjects. Now, STOU is testing with the students in three study centers. STOU hopes CAI will help the students study by themselves more actively and successfully.

After knowing the experimenting result of the use of CAI STOU will install or set it at the study centers scattered all over the country. Then, the students who have registered those difficult subjects, are able to use it. In addition to developing CAI for the students, STOU is also developing the use of telephone tutoring by hoping that it will help the student also.

In the future, if STOU can develop these new technological innovations, both CAI and telephone tutoring successfully, this will certainly affect the future of distance education of STOU in a good direction. I mean these new technological innovations will help the students and the public in general to believe that education is an essential factor in human existence, and also that education is a process and a chain of activities in which man is involved through his life those students will have more confidence in the STOU system, and this will make the future of distance education in the case of STOU assume a more important roles in Thai society.

On the third part, in conclusion, even though I raise the case of STOU I think I may generalize that, if every open university all over the world which holds the principle of lifelong education will try to improve and develop the technological innovations that are beneficial both to the students and the public in general, I then we'll make technological innovation contribute to enabling, development and empowering of student's learning as Dr. Morrison said yesterday. And by changing these technological innovations little by little because some technological innovations were expensive as Dr. Meuter said this morning, and being aware of using some technological innovations such as television as Prof. John Henningham said yesterday, and by using it properly as Keith Harry presented yesterday, I believe that the future of distance education will assume a more and more important role in the society. I don't worry about the present situation of distance education because most people are beginning to accept this system, and you can see the success of the University of the Air of Mr. Koda and other open universities as well. I think many researchers from National Institute of Multimedia Education can confirm this success.

Thank you to all of you again for listening to my discussion. Thank you.

Chairman: Thank you very much. At this time I would like to invite Prof. Kato to speak.

H. Kato: Thank you very much.

I would like to take this opportunity to express our thanks certainly to overseas

guests and speakers but also Japanese attendants who have taken their time to attend this symposium today.

I would like speak about four items.

First, I would like to tell you something about the theme, Technological Innovation and Life-Long Education, the relationship between the two. As many people may know, the terminology life-long education or continuing education was first used by UNESCO in 1972 if I remember correctly. And somebody referred to that expression for the first time in 1972 in UNESCO and in Japan in 1981 the Central Educational Study Council made a report entitled "Life-Long Education". In 1981 this report was produced by the Council, and on this basis an ad hoc committee was established to study the possibility of educational reform, which continued its activities until last year. In the 1981 report there was a rather clear distinction between the life-long education and life-long learning as two distinct concepts. I won't cite the sentences which distinguished one from the other, but if I try to summarize this distinction or these two concepts it would so something like this.

Every human being wants to continue learning throughout his or her life. And it is life-long education which offers opportunities for everyone who has that longing for learning to satisfy that need. Every educator has to offer that opportunity. So life-long education offers that opportunity to life-long learners. It is a kind of service offered to learners.

I understand President, Mr. Saito, must know much more about this concept. So when we discuss life-long education I think it necessary to talk about these two aspects.

Through technological innovation life-long education has become something available to everybody and there is an example of Shinshu University, and in Hokkaido, Hokkaido University, and there is another example of Ryukyu University in Okinawa. We have 13 national universities or state universities using broadcast and delivering programs through broadcast technology. Thanks to the availability of free usage of the broadcast system and technology and thanks to this availability, both those elderly persons and housewives as well as hospitalized persons can benefit from these opportunities given to them.

Another link between technological innovation and life-long education has something to do with the necessity to have life-long education. Because of the increasing demand for life-long education, technological innovation followed that necessity. Until March last year I was in the faculty of the University of the Air, and in total 37 local authorities or local communities asked me to lend them tapes used in our university. Because of the copyright issue I could not respond favorably to those demands and I still cannot respond favorably to their demand because of the same

copyright issue. The technological innovation is certainly needed because many local authorities do and companies private companies do want to offer life-long education chances to various people.

Next, I would like to touch upon the two-way communication which enables feedback on the part of the receivers of the education. One-way image and two-way sound can be one possibility. There can be several combinations. One-way video, two-way audio, etc. You may not like this expression. However, between the educators and the learners there is this situation of demand and supply. I hesitate to bring about this analogy in the presence of Prof. Kichi, an economist, but there must be a certain demand on the part of the potential student or students who would like to see certain type of courses programmed and offered to them. So this can be considered as a demand. As someone who provides this opportunity there is a university, a university with various curriculum that supplies students with those programs and curriculum.

As far as I see the situation not only in Japan but throughout the world, now that the life-long education system or education is now facing a new phase, the market with its own demand and supply is not yet mature, the structure as such is not mature. We don't know yet what are the subjects that are most demanded by the students. Basically the professors on the part of the university's authority do decide on what subjects are to be included in the curriculum and in some cases several centuries have seen and in other cases several tens of years have seen many types of curriculum and programs which have been the same and unchanged. However, on the part of the demand side, they might want to have new products instead of old, long standing, existing products.

It is important for us to provide education and instruction using new technology. Yet, it is also important to match the demand coming from the students and interactiveness is also necessary in this specific field between the students and the university authority. So, this has something to do with the market relationship.

The third aspect that I would like to refer to has something to do with the presentation we have heard about NEC by Mr. Kamata from NEC. Various companies throughout the world are eager to train their employees on the job training or other types of training. They want to give their employees chances to improve themselves. And I would like to introduce some figures. In Japan, money invested by Japanese companies for training is three times as large as the Japanese government budget for the national universities, allocated for national universities. An example was shown in regard to NEC which has educational and training activities and programs not only in Japan but outside Japan using satellite communication. This has given us a lot of lessons using satellite channels. Training employees can contribute to the increase and enhancement of productivity which in turn will bring about further technological

innovations. So, this contributes ultimately to the increase of GNP. This is one aspect.

There is another aspect, however, which is not that tangible, and that we should not forget. There is other type of demand on the part of the students. I understand Prof. Morrison has said something to the extent that the investment increased by 12% in the field of information, but GNP increased only by 2%. Investment in information technology does include, of course, investment for educational purposes. The average age of students at our University of the Air is 40. 40 year old students do get a degree, that does sometimes leads them to a better chance for a better job. However, it does not necessarily lead to better position in their respective work. Their motivation is for them to be better versed with a lot of new knowledge. So it does not lead to the increase of GNP or it doesn't lead to the improvement of their social status.

Some words about the developing countries. Of course, Japan is also a developing country as far as this specific aspect is concerned. I understand that a better access to education and training in the field of technology are the areas where an emphasis is put in many developing countries. compared with that, in Japan TV programs broadcasting have a nature of public service. I said one time that education can be interpreted as something which is very much like welfare. That was a slip of the tongue. I was thinking of the elderly persons who don't have anything else to do but to try to learn something more through TV programs. I was thinking of those elderly persons who don't have anything else to do. If our programs can help them better enjoy their life, I though it was a good thing. On the basis of this consideration I said something to the extent that education is one type of welfare so it can come under the jurisdiction of the Ministry of Health and Welfare instead of Ministry of Education, I wouldn't go further than that.

Cost effectiveness and higher education — I don't think there will be much link referred to between the two in the future.

The fourth point I would like to share with you is the following. During the past ten years, there was certain reference to the division of the world into the information rich people and information poor people or countries. On the one hand there are series of countries where there is a lot of information and technologies to have access to information, whereas in other countries where 2/3 of the world population live, people don't have access to information nor do they have technological means. Another way of looking at the same situation can be expressed in the following way. The opportunity rich countries and opportunity poor countries. Information rich countries are not necessarily countries which are opportunity rich. Prof. Henningham in his presentation said something to that extent, that it is dangerous to use television channels for educational and instructional purposes. That was a provocative remark which gave us a lot of hits. You can have many channels. At one channel you have a drama and at

another you have a baseball game, another channel gives you professional wrestling game, etc. Whenever you have a chance to TV watch, the only thing that you can watch is not something very meaningful. That is something I would call opportunity poor. So information rich countries are not necessarily opportunity rich countries. Information rich countries are very often opportunity poor and that is the case in Japan. Information rich and opportunity poor. It would be nice if we can have a country where people are information rich and opportunity rich at the same time.

Well, I have been trained very well at my University of the Air, so I would like to keep my time, limiting myself to 15 minutes. 30 seconds more? So I think I'd better conclude my presentation. Thank you.

Chairman: Thank you very much, Prof. Kato. This room is used as a studio for production of programs, and Prof. Kato is accustomed to following the Director's instructions. As many of you know, Prof. Kato's specialty is sociology. Some sociologists say very incisive and at times shocking things. Incidentally President Koda is also a sociologist. He happens to be the president, so he is an educator or the specialist in pedagogy. But Prof. Kato is a researcher scholar, so he is more free to talk. Thank you for your excision of use.

With the very good cooperation of the panelists we have kept the time and we have about 30 minutes available. We would like to active exchanges of views among panelists. And I am sure there may be questions to each other. At this point I should like to open the discussion to the floor and invite questions or comments from the audience. Anyone? Yes, please.

Y. Hirose: I am studying the broadcasting opportunity for disabled people's education in NIME. My name is Hirose. I was very much interested in what the panelists told us. As Prof. kato mentioned, we are information rich but opportunity poor in Japan. I cannot help but agreeing with that. I have to emphasize that especially the disabled people are the ones who are suffering from the opportunity poor situation. Prof. Harry pointed to the significance of the open university or distance education to benefit the disabled people. The fact that it is open to those people and the fact that the people are willing to come in to receive services are different. So, I hope Prof. Harry will further expand on the kind of services which would cater to the needs of the disabled in the best possible way through the means of distance education or open university.

Chairman: Prof. Harry, please.

K. Harry: Certainly, yes.

There are certain arrangements which are made at the Open University in the United Kingdom for disabled students, as I guess there are in quite a number of other institutions. I wouldn't say that the Open University arrangements are particularly exceptional but just to indicate what does happen.

There are somewhere over 2,000 students with disabilities of various kinds who are enrolled in Open University courses. There are more students who are disabled enrolled with the Open University than in all the other universities put together, which is not really surprising because it is obviously extremely difficult for some people to pursue their studies in the conventional university setting. There is an office which deals specifically with disabled students. There are a lot of course materials which are available in audio form which normally appear in printed form. What has happened is that volunteers have actually taped printed course materials; they have read the materials into the audio cassettes. And they are available for the students. The Institute of Educational Technology within the University has a couple of people who are particularly involved with students with disabilities, and they have undertaken some development work. They have developed some hardware which is specifically for hearing impaired students and some for vision impaired students. There is an annual visit which a number of students are able to make, who are on one of the fine arts courses. Again, it is a volunteer operation. Students are actually taken to continental Europe and I think there is a ratio of one student to one volunteer. Those are obviously some of the more mobile students.

The other thing which I can think of is that there has been a course produced in the University which is aimed at the people who work with disabled people on a day to day basis, not to work with them necessarily but who actually are caring for disabled people on a day to day basis.

Chairman: Thank you very much. I wonder if this answered your question?

Y. Hirose: Thank you for your explanation. I would like to introduce some figures. In the open university disabled students account for 3.5% in the undergraduate and in the total university 3.3%. In Japan, in ordinary universities disabled students are like 0.4% and in the University of the Air 1%. Those are some of the statistics.

Chairman: Thank you. Prof. Tada.

H. Tada: My name is Tada from National Institute of Multimedia Education. I would like to ask this question to Dr. Morrison and Prof. Nimpanich.

The overall topic of this symposium is technological innovation and life-long

education. We have been discussing new technology, new media and their relationship with distance education. We learned much from various presentations. My question is slightly away from the main topic and rather a rudimentary question. My question is, listening to various views since yesterday, I noticed that there was one point not being referred to the teaching materials in the printed form and the printed media in the distance education and their relationship with the broadcasting educational program. The reason why I raise this point is that I thought what Prof. Henningham mentioned was very provocative. And as Prof. Kato mentioned Prof. Henningham presented a very incisive view from a different point of view. I more or less specialize in the printed media and printed educational materials. I was very much impressed by what Prof. Henningham mentioned. Prof. Henningham mentioned that TV by definition has an entertainment factor in it and it may be detrimental for the educational purposes, whereas traditionally printed media was used in the educational context. And the significance of printed media in the educational context has not been fully elucidated as yet. Why is it that we will have to jump to the audio visual media? I think that was his point. In the educational context we, of course, should be looking into the significance and relevance of the broadcasting program in the educational context and Prof. Henningham cited Allen Bloom. I really to a large extent agree with what he said. The contents of education or the knowledge in learning in higher education so far have to a large extent been constructed by printed media and words. In academic pursuits such learning has been accumulated. The rapid progress in the printing technology or printed media textbooks or teaching materials play, a major role nowadays. So in order to convey the systematized knowledge in an accurate way the best possible means I think is still the printed media. Pace and speed of learning is I think dependent or attuned to the printed media.

We could say the same thing about distance education as well. In the open university, the role to be played by printed media in the overall learning is very important. And the role played by TV media, I understand, is less than 10%. In case of German institutions or South Korea or STOU of Thailand, the printed teaching materials or media are the mainstreams of the teaching materials as we understand it.

Printed media is in the form of printing, so it does not convey visual or audio image or sense, but to convey abstract or logical thinking the printed media should not be overlooked. Its importance should be duly regarded. With the tremendous development of new media in educational engineering, much has been introduced and much has been improved. But when we go back to the very basis and foundation of education, I still think the very basis would be learning through printed media. So the broadcasting TV or radio are here to supplement such learning. That I think would be a more orthodox approach.

In Athabasca University or STOU, what would be the positioning or significance of printed media an how are they related to the broadcast media in your educational context? I would appreciate your comments.

Chairman: First then I will ask our panelist and then I will ask Mr. Henningham to make brief comments.

J. Nimpanich: In case of STOU, as you know, we use mixed media. The important media or main media we use such as correspondence, textbooks, workbooks, radio and television broadcast handbook. And the supporting media we use radio and television broadcast, including broadcasting of video tapes and course material recorded on audio cassette tapes. We have tutoring and counseling sessions at every lower regional study centers throughout the country. The main reason that STOU think the main media should be text because this media can help the students study by themselves efficient while others media still have same problem such as TV broadcasting is some limitation because in some areas the students cannot receive the signal, but in the future STOU will try to see the importance of supporting medias such as TV and Radio in tutoring and counseling.

Chairman: Would you like to say something?

T.R. Morrison: I would make three points.

The first point, that the basis of education historically is not print. It is the voice, not print. It is talking. That is the basis in Japanese culture and in our culture. So that those who argue the television is destroying the foundation of learning, need to reread history. Point 1.

Point 2 is that in most distance education institutions prints is still the foundation of what is transmitted at this point in time. I don't think there is any debate about it. Even computer assisted learning, it is print based. It just comes on a television screen. Now, you can do things in a computer assisted learning program that you cannot do by turning the pages of a book. Absolutely. A book can't branch to remedial lessons instantaneously when you make a mistake; it cannot do it. Or it will take you years and the book will have to be that big. So there are some things that computers can do in the manipulation of print that a book cannot. But most is still print based. However, there is a view — I happen to share this view — there is a view in science today and it is based on the concept of multiple representation of knowledge. That is the notion that you can have a given body of knowledge but it can be represented in different ways, and in fact you learn different concepts, different ways through different mediums. If that is true, I

happen to think that you learn to play a piano differently than you learn logical thinking through print. It is a different experience; different medium is required. If that is the case, then newer media that can enlarge the ways in which you can represent knowledge and enhance and enlarge knowledge have an important role to play. I see it in that dimension. The key question is whether, say, television in its current stage of development, has in fact fully exploited itself as a medium from a learning potential. I think there is a tremendous potential in the television, but if all you are seeing in TV is a talking head, you don't necessarily need a television for that. You can listen to it on a voice basis unless you really want to see the response of the person that you ask the question to.

By and large those are my comments. Most systems are still print based. In the future in my view the print will still be there. However, there will be other modes of representing and creating knowledge there. And those are being developed right now. We have got to pay attention to those.

Chairman: Thank you very much. Dr. Harry, do you have any words to add?

K. Harry: I would go along with what Dr. Morrison said. I would agree with him.

Chairman: Now, Dr. Henningham, do you have anything to add to the previous comments?

J. Henningham: I thought that was a very relevant comment of Prof. Morrison's about the basis of teaching being in the form of the voice. Of course, traditionally bodies of knowledge have been kept in written form, except in those societies that do not have a written language and they must depend upon extended stories passed in oral form from one generation to another such as we find in Hawaii. However, the extent of the body of knowledge which can be kept by that means is limited compared to that which can be kept by means of the written word. Of course, with a variety of technologies we do have the means to store knowledge with a variety of ways and different kinds of knowledge such as the knowledge how to play a piano. And I think that is very true.

I want to pass on an interesting discussion that I had with Prof. Nasu, who yesterday was so helpful for us in understanding earthquakes. He pointed out an experiment he had undertaken comparing the performance of students who used only textbooks versus students who used textbooks plus television in an open university course. He pointed out that his textbook contained all the information necessary for the students to pass the course. However, when comparing the performance of students who depended only on the textbook with students who depended on the

textbook and also used television, those students who used the textbook plus TV did better in their exams than the students who used the textbook only. He presented various hypotheses for this. I agree that such a factor as motivation may well account for this, the fact that such students are more interested in studies and put more time into it plus the repetitive factor as well. But I think it would be interesting to see an experiment of two types of students totally separated from other medium, where one group look only at textbooks and the other only at television and to compare their respective performance. I suspect that those who had only the textbooks would do rather better than those who only had the television. That is an experiment perhaps that the Hoso Daigaku could do in the future.

Chairman: Yes, please.

T.R. Morrison: I would just like to comment. I think that would be a fantastic experiment. My question would be in relation to what would the test be based, what skill would we be talking about? If you said to me let's have that test, I'd say let's do it, because there are some skills that you can't learn through print, but through television you could. So, that depends on what the test would be about.

Chairman: Mr. Abrioux.

D.Abrioux: Dominique Abrew (?) from Athabasca University. I have been very interested by the symposium. I found it very stimulating for two reasons. On the one hand it has introduced some new ideas for me personally and on the other hand has shown what the current state internationally is of distance education. I would like just to mention briefly three issues which I think have not been summarized in this session, but for me are important.

One is that as educators we must constantly remind ourselves that life-long learning must better address the kind of learner that is involved in life-long learning. We have to take into account much more for whom we are preparing the material. For example, there is all the discussion about television, about traditional teaching, lecture teaching. Now, personally I have reservations about lecture based teaching for adolescents, whether in a classroom or whether it is broadcast. Those reservations are even stronger in dealing with adults, and even stronger again when we hear about a classroom session being broadcast to a different kind of audience in a remote location. I think those are the issues which in the future we should be looking at the kind of learners, whether the learner's need are different.

The second one is one which is sometimes difficult for the educators to face... That

is, I believe that we should be addressing the failures of technology in distance education as much as the succersses. Perhaps it is inevitable that we hear a great deal about the successes of technological innovation and life-long learning and distance education. However, personally I believe we could learn, whether as much or less I am not sure, but we could certainly learn a great deal from hearing about some of the failures. I personally have had experience in one which I won't recount, but there was two-way audio, one-way video teaching of French to beginners which was a complete disaster. I won't bore you with details, but I think that those types of experiments are important, even through research is not published about them. And symposia tend not to emphasize them.

The third one is the concern that I have which is that distance education institutions, autonomous ones such as my own, such as the University of the Air, are engaging in too much television. We are putting too many eggs in one basket. When we hear about and read about innovation in distance education, my perspective or my conclusion is that it is business, and that the traditional universities are doing all the interesting experimentation in distance education. Now I can hypothesize as to why that happens. I believe that there are a couple of reasons. One is that we build an infrastructure, in my case, in case of Athabasca University Printing Presses; in the case of the University of the Air perhaps broadcasting; and it makes it very hard for experimentation innovation to occur. The other one which is perhaps more important is that we — I was going to use the word burden but that is not quite correct — we expect a great deal of our faculty in the teaching. We are committed to expanding education to people who do not have access to it and so the primary role of our faculty is teaching, and that is in developing courses which leaves very little time for experimentation and for research. And I think those are two challenges which distance education institutions in particular are going to have to face in the future.

Chairman: Thank you very much. I think I saw another hand earlier. Prof. Higashi?

Higashi: I have a very simple question regarding the future of distance university education. Thanks to technological innovation and institutions of distance university education, it is true that more people than ever are receiving education at the university level. But I am very naively wondering what should be the extent to which a nation should be college educated. When would or should people concerned with distance education be satisfied regarding the extent to which university distance education is spread across the nation? Perhaps Presidnt Morrison might care to answer this question, because he has one such institution. I would like whoever answers this question to be using one of the quantitative terms like every person should

receive it, as many persons as possible should receive it, or more than a half of the nation should receive it, or one qurter of the nation should receive it.

Chairman: Would you care to answer? Perhaps Kato-Sensei would like to.

T.R. Morrison: That is a typical question from a linguist. *(Laughter)*

I would not escape the question but rephrase it in this sense. The issue in my personal view which I would also argue should be the view of any society which is concerned about the development of itself as a society and individuals within it. Principle in my view is this, that the opportunity for accessing higher education including universities should be available to any person who desires that opportunity and who can benefit from it. And it is the obligation of a society to provide for that and to remove those barriers which stand in the way of realizing that. If that means in a given society that that number is 100%, so be it. That is the number.

H. Kato: The question is beyond my ability to respond. Maybe toward the end of the 21st century the question that was just posed by Prof. Higashi will change into the question whether what percentage of the nation should obtain a Ph.D., 100%, 25%, or 1/3. Thinking back what was the situation like in Japan one century ago, the question was to what extent the nation should allow the people to go to the high school or junior high school education level, 20% of children would go up to the junior high, the university ecucation was very expensive, very much exhorted dream for anybody 100 years ago.

One magazine in Japan is going to have a special article about the issue of education in the age of mass. I do not know what they will be suggesting in the magazine, but there is this trend. There is always a question that the no one is different whether it is junior high school or college degree or undergraduate degree or Ph.D., depending on the time. However the 21st century I think it is going to be the Ph.D. It is just my hunch: I have no grounds for my saying this.

Chairman: It is almost time for us to conclude but if there is one more question, perhaps we can extend. Just one more question. Yes, please.

(Floor): Yes, one last question. With regard to Dr. Kato's words that companies are competitor to us with regard to the distance education. As one example, NHK was the first to introduce correspondence education using broadcasting. Large companies in Japan wanted to use NHK facilities for the purposes of employee training. In the case of the Open University of the United Kingdom, I believe that at least in the earlier stages,

it was teachers who took those courses. So, the teachers wanted to improve their own teaching skills as well as maybe wishing to see higher remunerations, higher salaries. This means of education of open university was used I understand in the United Kingdom by many teachers. We can say teachers comprise one industry. In the case of Japan private companies used the NHK services in the beginning. Even though in some respects we are competitors, in many respects we can cooperate with the private sector, I believe.

Chairman: Thank you very much.

Kita: Can you give me 30 seconds? The National Universities of Japan have a committee to study the use of radio. And they have a group or a committee comprising the deans of engineering departments. In those discussions they said the largest competitors for the national universities of Japan were companies. However, companies are the ones who know what the business situation in real life is. Therefore, there will be the biggest life in terms of business of creation of things which in turn relate to the creation of people.

I just wanted to make this comment.

Y. Fukui: This is exactly time for us to be concluding our symposium, I would like to thank the panelists for your cooperation.

I believe there is a message. Vice President Obi who was supposed to be here to deliver his closing remarks, has asked me to say the concluding remarks on his behalf.

I would like to thank you for your very active participation in the heated discussion for the past two days. Being involved in the activities of the National Institute of Multimedia Education, I have been able to learn a great deal from the discussions so far. We have been able to use a lot of what we have learned.

Personally, and this is related to what was mentioned by Dr. Kato, I don't think companies will be our competitors. Because NEC provided a language training course, but they have no Shakespeare in it. We are thinking about human development. Be it Shakespeare or La Seine, we are involved in education of that nature. Private sectors are perhaps neglecting that kind of education or maybe relaying on the university education for literally academic teaching.

I think in terms of the funding of the university activities, I think we can work together.

This was just a personal complaint of somebody who was very much interested in little studies, particularly French literature.

I hope the programs can be developed to enhance the level of understanding of

those studies. In so doing, we would be no doubt holding another and more of these symposia and therefore I would like to take this opportunity to ask for your future participation in our symposiums in the times to come.

With that I thank you for your attention.

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